CITY OF SANTA BARBARA
PARKS AND RECREATION DEPARTMENT

MEMORANDUM

DATE: September 9, 2013

TO: IPM Advisory Committee

FROM: Simon Herrera, Golf Course Superintendent

SUBJECT: Material Exemption Request for FY 14

The City of Santa Barbara Parks and Recreation Department- Golf Division is requesting that the IPM Advisory committee approve the attached FY14 list of materials for exemption. The request for the materials listed has not changed from FY 13 and all the technical information is current. The golf course staff will only use these products when accepted thresholds are exceeded and all alternative options have been exhausted.

Below is the list of materials that the Golf Division is requesting for FY 14.

Heritage
Trimmit
Primo Maxx
Acelepryn
Medallion
Daconil
Affirm
Banner-Maxx
Prostar
Proxy

Thank you so very much for your consideration.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone (805) 564-5464 SIMON HERRERA
Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone (805) 564-5547
Application Site GOLF COURSE Specific Location GREENS
Date(s) AS NEEDED
Product Name HERITAGE Active Ingredient AZOXYSTROBIN
Number of Applications: ☐ One-time ☒ Other AS NEEDED (NO MORE THAN 3X/YEAR)
- Type: ☐ Emergency ☐ Trial Programmatic ☒ Other

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other
Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other

Is the pesticide on the *Tiered Materials List*? ☒ No Yes If yes, provide the Tier

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 100-1323 Signal CAUTION Estimated Tier II
Restricted ☒ No ☐ Yes/Describe
P Waste PBT WA PBT Persistant LOW Mobil LOW
Cancer NONE Repro NONE Neuro NONE Endocrine NONE
Bird LOW/NONE Fish ~~MOD~~ HIGH Bees LOW/NONE Wildlife LOW/NONE

☒ Attach product label and MSDS to this form.

Describe the pest problem.
FUNGAL PATHOGENS ATTACK TURF CAUSING DAMAGE THAT IS DETRIMENTAL TO TURF HEALTH AND CONDITIONING.

Describe the management goals and objectives for this site.
CONTINUE W/CREEPING BENTGRASS PROMOTION UNTIL A MONOSTAND IS FORMED.

What is the damage threshold for this pest at this site?
MINIMAL

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE CHECKED ON A DAILY BASIS. DECISION TO MAKE APPLICATION IS BASED ON FUNGAL PATHOGEN + DISRUPTION TO PUTTING SURFACE.

Describe how the product would be applied including frequency, concentration, and method of application.
APPLIED AS NEEDED, 2-4 oz./1000 m^2, SPRAYER

What non-target impacts are anticipated?
NONE.

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. CONTROLS MOST DISEASE OUTBREAKS / CURATIVE

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How will the effectiveness of this product be monitored? Include expected results and indicators of success.
GREENS WILL BE MONITORED AFTER APPLICATION IN A DAILY BASIS. IMPROVED PLANT HEALTH AND A REDUCTION IN DISEASE PRESSURE ARE THE EXPECTED RESULTS.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PUTING GREENS, NON PHDER ZONE, NI RUNOFF CONCERNS.

List alternatives considered, alternatives implemented and why they were eliminated.
ROLLING GREENS INSTEAD OF MOWING TO REDUCE STRESS. RAISING THE HEIGHT OF CUT TO REDUCE PRESSURE. SPIKING AND SEEDING AREAS THAT HAVE BEEN MOST AFFECTED BY DISEASE.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible. APPLYING THIS PESTICIDE WOULD BE AS A LAST MEASURE. THIS PRODUCT IS A TIER 4 FUNGICIDE WHICH MAKES IT SAFER THAN OTHERS IN THE MARKET. NON-CHEMICAL OPTIONS ARE IMPLEMENTED UNTIL PRESSURE IS TOO GREAT.

Was outside expertise utilized? ☐ No ☑ Yes / Describe
LOCAL SUPERINTENDENTS HAVE CONSULTED WITH ADVICE AND EXPERIENCE CONTROLLING DISEASES.

Describe future plans to prevent using the chemical again.
INCREASING BENTGRASS POPULATIONS WILL ELIMINATE THE NEED FOR THIS PRODUCT ON POA ANNUA

Signatures _____ _____
Department IPM Coordinator — City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

pproved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 (MARK REED

Application Site GOLF COURSE Specific Location GREENS

Date(s) ~~ANNUAL~~ SPRING / FALL

Product Name ~~TRIM~~ TRIMMIT Active Ingredient POA BUTRAZOL

Number of Applications: ☐ One-time ☐ Other _____

- Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☐ Fungicide ☒ Other GROWTH REGULATOR

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☒ No Yes If yes, provide the Tier _____

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 100-1014 Signal CAUTION Estimated Tier _____

Restricted ☐ No ☐ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil LOW

Cancer NONE Repro NONE Neuro NONE Endocrine NONE

Bird NONE Fish LOW Bees NONE Wildlife LOW

☒ Attach product label and MSDS to this form.

Describe the pest problem.
POA ANNUA COMPETING AGAINST CREEPING BENTGRASS.

Describe the management goals and objectives for this site.
COMPLETE ERADICATION OF POA ANNUA TRANSITIONING TO A FULL MONO STAND OF CREEPING BENTGRASS.

What is the damage threshold for this pest at this site?
LOW

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE MONITORED ON A DAILY BASIS. POA ANNUA THAT IS AFFECTED BY DISEASE IS SPIKED AND SEEDED WITH CREEPING BENTGRASS.

Describe how the product would be applied including frequency, concentration, and method of application.
THIS PRODUCT WOULD BE APPLIED 2-3X IN THE SPRING + FALL TO REGULATE POA ANNUA GROWTH. IT WOULD BE APPLIED @ 4-6OZ/ACRE WITH A SPRAYER.

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.
THIS PRODUCT REDUCES THE COMPETITIVENESS OF POA ANNUA ALLOWING CREEPING BENTGRASS TO OUT COMPETE THE POA ANNUA LEADING TO A STAND OF CREEPING BENTGRASS.

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MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
THIS PRODUCT WILL BE MONITORED BY MEASURING DAILY CLIPPINGS PRODUCED BY MOWERS. WE EXPECT TO SEE A MORE ESTABLISHED ROOT SYSTEM AND A COMPETIVE EDGE AGAINST THE POA ANNUA.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
GREENS, NO DEGREE OF RUNOFF OR SOIL ACCUMULATION.

List alternatives considered, alternatives implemented and why they were eliminated.
NONE

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
THIS PRODUCT WILL HELP US ACHIEVE A MONOSTAND OF BENTGRASS MUCH FASTER THAN NOT USING IT. OVERTIME A MONOSTAND OF BENTGRASS WILL REQUIRE SIGNIFICANTLY LESS CHEMICAL INPUTS OVERALL

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS MADE SUGGESTIONS TO EXPEDITE CREEPING BENTGRASS POPULATIONS.

Describe future plans to prevent using the chemical again.
ONCE OUR GOALS ARE ACHIEVED THIS PRODUCT WILL ONLY BE USED DURING THE SUMMER MONTHS ON A BI-WEEKLY BASIS.

Signatures _____ Department IPM Coordinator _____ City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

Approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464 SIMON HERBER

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 (~~MIKE REED~~)

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name PRIMO MAXX Active Ingredient TRINEXAPAC - ETHYL

Number of Applications: ☐ One-time ☐ Other _____

- Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☐ Fungicide ☒ Other GROWTH REGULATOR

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No (Yes) If yes, provide the Tier 4

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # _____ Signal _____ Estimated Tier _____

Restricted ☐ No ☐ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
EXCESSIVE VERTICAL GROWTH OF CREEPING BENTGRASS

Describe the management goals and objectives for this site.
ENCOURAGE LATERAL GROWTH OF TURFGRASS CREATING MORE LEAF TISSUE WHICH WILL LEAD TO A MORE ESTABLISHED ROOTSYSTEM AND ~~MORE~~ QUICKER

What is the damage threshold for this pest at this site?
NO THRESHOLD

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
N/A

Describe how the product would be applied including frequency, concentration, and method of application.
THE PRODUCT WOULD BE APPLIED ON A BI-WEEKLY BASIS @ .1-.125 OZ/M2 USING A SPRAYER

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.
USING THIS PRODUCT WILL FORCE THE CREEPING BENTGRASS TO MOVE LATERALLY ALLOWING IT TO OUT COMPETE THE POA ANNUA AT A MORE RAPID RATE.

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How will the effectiveness of this product be monitored? Include expected results and indicators of success.
AFTER APPLICATION SOIL IS MONITORED FOR BTA POPULATIONS. EXPECTED RESULTS ARE A COMPLETE REDUCTION IN BTA POPULATIONS.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
NONE

List alternatives considered, alternatives implemented and why they were eliminated.
THIS IS THE SAFEST MOST EFFECTIVE PRODUCT IN THE MARKET.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
THIS IS A GREEN PRODUCT W/NO HEALTH CONCERNS.

Was outside expertise utilized? ☐ No ☒ Yes / Describe
THIS PRODUCT WAS SUGGESTED BY A LOCAL SUPERINTENDENT.

Describe future plans to prevent using the chemical again.
WILL USE EACH SPRING TO CONTROL BTA GRUBS. THIS IS THE SAFEST PRODUCT MONEY CAN BUY.

Signatures _____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

Approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-6464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 (SIMON HERRE [redacted])

Application Site GOLF COURSE Specific Location GREENS

Date(s) 1 SPRING

Product Name ACELEPRYN Active Ingredient CHLORANTRANILIPROLE

Number of Applications: ☒ One-time ☐ Other

- Type: ☐ Emergency ☐ Trial Programmatic ☐ Other

Product type: Herbicide ☒ Insecticide ☐ Fungicide ☐ Other

Application: ☐ Ornamental Turf ☐ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other

Is the pesticide on the *Tiered Materials List*? ☒ No Yes If yes, provide the Tier

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 352-731 Signal NONE Estimated Tier 4+

Restricted ☒ No ☐ Yes/Describe

P Waste ____ PBT ____ WA PBT ____ Persistant ____ Mobil ____

Cancer NONE Repro NONE Neuro NONE Endocrine NONE

Bird NONE Fish NONE Bees NONE Wildlife NONE

☒ Attach product label and MSDS to this form.

Describe the pest problem.
BLACK TURFGRASS ATAENIUS GRUBS FEED ON ROOT SYSTEM OF TURF

Describe the management goals and objectives for this site.
CONTROL BTA GRUBS

What is the damage threshold for this pest at this site?
LOW

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
MONITOR GREENS IN MID - LATE SPRING FOR BTA GRUBS BY REMOVING SOIL PLUGS.

Describe how the product would be applied including frequency, concentration, and method of application.
PRODUCT WOULD BE APPLIED IN SPRING (LATE APRIL) AT FIRST SIGN OF JUVENILE BTA GRUBS. IT WOULD BE APPLIED @ .367 OZ/M² WITH A SPRAYER.

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. THIS IS A GREEN PRODUCT WITH NO ADVERSE AFFECTS TO WILDLIFE, HUMANS, BEES ETC...

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
GREENS WILL BE MONITORED BEFER APPLICATION IN A DAILY BASIS. IMPROVED PLANT HEALTH AND A REDUCTION IN DISEASE PRESSURE ARE THE EXPECTED RESULTS.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PUTTING GREENS, NON PHDER ZONE, NO RUNOFF CONCERNS.

List alternatives considered, alternatives implemented and why they were eliminated.
ROLLING GREENS INSTEAD OF MOWING TO REDUCE STRESS. RAISING THE HEIGHT OF CUT TO REDUCE PRESSURE. SPIKING AND SEEDING AREAS THAT HAVE BEEN MOST AFFECTED BY DISEASE.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible. APPLYING THIS PESTICIDE WOULD BE AS A LAST MEASURE. THIS PRODUCT IS A TIER 4 FUNGICIDE WHICH MAKES IT SAFER THAN OTHERS IN THE MARKET. NON-CHEMICAL OPTIONS ARE IMPLEMENTED UNTIL PRESSURE IS TOO GREAT.

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS HAVE CONSULTED WITH ADVICE AND EXPERIENCE CONTROLLING DISEASES.

Describe future plans to prevent using the chemical again.
INCREASING BENTGRASS POPULATIONS WILL ELIMINATE THE NEED FOR THIS PRODUCT ON POA ANNU

Signatures _____ _____
Department IPM Coordinator — City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

pproved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 SIMON HER

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name MEDALLION Active Ingredient FLUDIOXONIL

Number of Applications: ☐ One-time ☐ Other _____

- Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other _____

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No (Yes) If yes, provide the Tier 4

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 100-769 Signal _____ Estimated Tier 4

Restricted ☐ No ☐ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
ANTHRACNOSE, YELLOW PATCH, PINK SNOW MOLD

Describe the management goals and objectives for this site.
BALANCED FERTILITY AND WATER INPUTS. MONAGING THATCH LAYER TO MINIMIZE FUNGAL POPULATIONS. OBJECTIVES ARE TO CREATE A MONOSTAND OF BENGRASS RESISTANT TO ANTHRACNOSE

What is the damage threshold for this pest at this site?
LOW

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE MONITORED DAILY FOR PLANT HEALTH, FERTILITY LEVELS AND WATERING NEEDS. BALANCED WATER INPUTS AND LOW LEVELS OF FERTILIZER ARE APPLIED ON A WEEKLY BASIS.

Describe how the product would be applied including frequency, concentration, and method of application.
THE PRODUCT WOULD BE APPLIED WHEN THRESHOLDS ARE EXCEEDED ON AS NEEDED BASIS. .25-.50 oz/m^2 WITH SPRAYER.

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. WOULD BE USED AS ALTERATIVE APPLICATION TO CONTROL DISEASE OUTBREAK. THIS WOULD HELP ACHIEVE THE DEPARTMENTS GOALS OF FINELY MANICURED, DISEASE FREE GREENS.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
MONITOR GREENS DAILY AFTER APPLICATION. REDUCED DISEASE PRESSURE AND IMPROVED PLANT HEALTH AND EXPECTED

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PUTTING GREENS, NO RUN-OFF CONCERNS

List alternatives considered, alternatives implemented and why they were eliminated.
BALANCED WATER AND FERTILITY INPUTS, ROLLING GREENS INSTEAD OF MOWING. THIS PRODUCT WOULD ONLY BE USED WHEN ALL ALTERNATIVES ARE EXHAUSTED.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
THIS APPLICATION IS THE BEST SOLUTION BECAUSE IT WILL ONLY BE USED WHEN ALL OTHER OPTIONS HAVE BEEN USED.

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS HAVE CONSULTED ME AND OFFERED ADVICE.

Describe future plans to prevent using the chemical again.
INCREASING BENTGROSS POPULATIONS AND ELIMINATING POA ANNUA.

Signatures _____ Department IPM Coordinator _____ City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 (SIMON HEARD ~~MARK REED~~)

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name DACONIL ULTREX Active Ingredient CHLOROTHALONIL

Number of Applications: ☐ One-time ☐ Other _____

Type: ☐ Emergency ☐ Trial Programmatic ☒ Other _____

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other _____

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No ☒ Yes If yes, provide the Tier 1

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 50534-209-100 Signal CAUTION Estimated Tier 1

Restricted ☐ No ☐ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant LOW/MOD Mobil LOW

Cancer LIKELY Repro NONE Neuro NONE Endocrine ?

Bird YES Fish YES Bees NO Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
ANTHRACNOSE, DOLLAR SPOT,

Describe the management goals and objectives for this site.
CONTINUE PROMOTING BENTGRASS POPULATIONS TO ELIMINATE NEED FOR DACONIL.

What is the damage threshold for this pest at this site?
LOW

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE MONITORED ON A DAILY BASIS. DECISIONS FOR WATERING AND FERTILITY INPUTS ARE MADE BASED ON PLANT HEALTH + GROWTH.

Describe how the product would be applied including frequency, concentration, and method of application.
DACONIL WOULD BE APPLIED AS NEEDED WHEN DISEASE THRESHOLDS ARE MET. 3.0 - 5.5 oz/m², SPRAYER

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. WOULD BE USED AS A CURATIVE TANK MIXED WITH A BROAD SPECTRUM FUNGICIDE REDUCING DISEASE PRESSURE.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name AFFIRM Active Ingredient POLYOXIN-D ZINC SALT (BIO-PESTICIDE)

Number of Applications: ☐ One-time ☐ Other

- Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other

Is the pesticide on the *Tiered Materials List*? ☒ No Yes If yes, provide the Tier

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 68173-3-1001 Signal CAUTION Estimated Tier 4

Restricted ☒ No ☐ Yes/Describe

P Waste PBT WA PBT Persistant NO Mobil NO

Cancer NO Repro NO Neuro NO Endocrine NO

Bird NO Fish POSSIBLE Bees NO Wildlife NO

☒ Attach product label and MSDS to this form.

Describe the pest problem.
ANTHRACNOSE, FAIRY RING

Describe the management goals and objectives for this site.
BALANCED FERTILITY AND WATER MANAGEMENT. PROMOTION OF CREEPING BENTGRASS POPULATION WHICH ARE RESISTANT TO ANTHRACNOSE.

What is the damage threshold for this pest at this site?
FAIRY RING - MODERATE ANTHRACNOSE - MINIMAL

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE MONITORED EVERY DAY AND WEATHER PATTERNS ARE MONITORED (FOG, RAIN, HUMIDITY)

Describe how the product would be applied including frequency, concentration, and method of application.
WOULD BE APPLIED AS A CURATIVE APPLICATION WHEN THRESHOLDS ARE MET OR EXCEEDED. .009 - .018 OZ/acre SPRAYER

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.
WILL HELP WITH CONTROL OF ANTHRACNOSE AND FAIRY RING. THIS IS A BIO-PESTICIDE HELPING US ACHIEVE OUR GOAL OF USING LESS TOXIC PRODUCTS. THIS WOULD BE USED AS A CURATIVE

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
DISEASE PRESSURE WILL BE MONITORED DAILY AFTER APPLICATION. EXPECTED RESULTS WOULD BE THE CONTROL OF PATHOGENS AND IMPROVED PLANT HEALTH.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
LIMITED CHANCE FOR RUNOFF. PRODUCT WILL BE WATERED IN FOR 3-5 MINUTES.

List alternatives considered, alternatives implemented and why they were eliminated.
DEW REMOVAL EACH MORNING, MANUAL ROLLING INSTEAD OF MOWING. THESE ALTERNATIVES ARE NEVER ELIMINATED, BUT AN APPLICATION IS SOMETIMES NECESSARY DUE TO DISEASE PRESSURE.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
THIS PESTICIDE IS LESS TOXIC THAN MOST. NOT MAKING ACTION WILL LEAD TO SEVERE DAMAGE TO THE GREENS AFFECTING PLAYABILITY + REVENUE.

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS HAVE BEEN CONSULTED FOR ADVICE.

Describe future plans to prevent using the chemical again.
A MONOSTAND OF BENTGRASS WILL ELIMINATE THE NEED FOR ANTHRACNOSE APPLICATIONS.

Signatures _____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name BANNER MAXX Active Ingredient PROPICONAZOLE

Number of Applications: ☐ One-time ☒ Other AS NEEDED

- Type: ☐ Emergency ☐ Trial Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other _____

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No Yes If yes, provide the Tier _____

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # _____ Signal _____ Estimated Tier _____

Restricted ☐ No ☒ Yes/Describe TIER 1

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer NONE Repro NONE Neuro _____ Endocrine _____

Bird NONE Fish MODERATE Bees NONE Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
FUNGAL PATHOGENS ATTACK TURF CAUSING DAMAGE THAT IS DETRIMENTAL TO TURF HEALTH AND CONDITIONING

Describe the management goals and objectives for this site.
CONTINUE W/CREEPING BENTGRASS PROMOTION UNTIL A MONOSTAND IS FORMED

What is the damage threshold for this pest at this site?
MINIMAL

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE CHECKED ON A DAILY BASIS. DECISION TO MAKE IS BASED ON FUNGAL PATHOGEN + DISRUPTION TO PUTTING SURFACE.

Describe how the product would be applied including frequency, concentration, and method of application.
APPLIED AS NEEDED, 1-2 oz/m^2, SPRAYER

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. CONTROLS ANTHRACNOSE AND FUSARIUM PATCH

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ow will the effectiveness of this product be monitored? Include expected results and indicators of success.
MONITOR GREENS DAILY AFTER APPLICATION. REDUCED DISEASE PRESSURE AND IMPROVED PLA HEALTH IS EXPECTED

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PUTTING GREENS, MINOR RUNOFF CONCERNS

List alternatives considered, alternatives implemented and why they were eliminated.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
THIS IS THE BEST OPTION BECAUSE IT WILL BE USED AS A CURATIVE TREATMENT, LESS HAZARDOUS AGRONOMIC MEASURES ARE ALWAYS IMPLEMENTED FIRST, THIS PRODUCT WOULD BE USED WHEN OTHER LESS-HAZARDOUS OPTIONS ARE EXHAUSTED

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS HAVE CONSULTED ON CONTROL MEASURES + REPRESENTATIVES FROM SYNGENTA, BAYER + CLEARY'S HAVE OFFERED ADVICE.

Describe future plans to prevent using the chemical again.
CONTINUED INCREASES IN BENTGRASS POPULATIONS WILL LIMIT THE USE OF FUNGICIDES AT THE GOLF COURSE

Signatures _____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

pproved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESQUEDA Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547

Application Site GOLF COURSE Specific Location GREENS

Date(s) AS NEEDED

Product Name PROSTAR Active Ingredient FLUTOLANIL

Number of Applications: ☐ One-time ☐ Other _____

Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☒ Fungicide ☐ Other _____

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No ☒ Yes If yes, provide the Tier _____

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 432-1477 Signal CAUTION Estimated Tier _____

Restricted ☐ No ☒ Yes/Describe TIER 4

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer NONE Repro NONE Neuro NONE Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
FAIRY RING / WAITEA PATCH IRREGULARLY SHAPED RING PATTERNS DEVELOP ON GREENS.

Describe the management goals and objectives for this site.
BALANCED WATER + FERTILITY INPUTS ARE OBJECTIVES USED TO MINIMIZE THE BUILD UP OF A THATCH LAYER WHERE THE PATHOGENS THRIVE.

What is the damage threshold for this pest at this site?
MODERATE

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
GREENS ARE CHECKED EVERY DAY FOR DISEASE PRESSURE. FAIRY RING / WAITEA PATCH ARE MOST ACTIVE LATE SPRING / EARLY SUMMER. IF NEEDED THIS PRODUCT WILL BE USED ONE TIME.

Describe how the product would be applied including frequency, concentration, and method of application.
APPLIED TO GREENS AND WATERED IN TO CONTROL FAIRY RING / WAITEA PATCH IN THE SPRING
2.2 - 4.5 OZ. / M2 SPRAYED

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. THIS WOULD BE A CURATIVE APPLICATION.

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ow will the effectiveness of this product be monitored? Include expected results and indicators of success.
TYPICALLY RESULTS ARE REALIZED 7-10 DAYS FOLLOWING THE APPLICATION WITH FULL CONTROL OF PATHOGENS.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PRODUCT WILL BE WATERED IN FOR 3-5 MINUTES WITH A SOIL PENETRANT. BECAUSE OF THE TIMING OF THE APPLICATION, RUNOFF IS NOT A CONCERN (i.e. RAIN)

List alternatives considered, alternatives implemented and why they were eliminated.
BALANCED FERTILITY, RESPONSIBLE WATER TECHNIQUES + AERIFICATION ARE ALL RESPONSIBLE CULTURAL PRACTICES. SOME VARIETIES OF THESE PATHOGENS ARE COSMETIC, BUT CAN LEAD TO TURF LOSS.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
UNFORTUNATELY, THERE ARE NO LESS HAZARDOUS SOLUTIONS TO CONTROL THIS DISEASE WHEN AN OUTBREAK OCCURS.

Was outside expertise utilized? ☐ No ☒ Yes / Describe
LOCAL SUPERINTENDENTS HAVE VISITED THE PROPERTY TO OFFER SUGGESTIONS AND ALTERNATIVES.

Describe future plans to prevent using the chemical again.
IF FUTURE OUTBREAKS ARE MONITORED AND IDENTIFIED EARLY WE CAN USE THE FUNGICIDE AFFIRM (POLYOXIN ZINC S. WHICH IS A SAFER ALTERNATIVE.

Signatures _____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

Approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept Parks and Recreation IPM Coordinator SANTOS ESCOBAR Phone 564-5464

Pesticide Applicator (employee or company) Name City Park and Recreation staff Phone 564-5547 SIMON HERRERA

Application Site GOLF COURSE Specific Location GREENS

Date(s) WINTER / SPRING

Product Name PROXY Active Ingredient _____

Number of Applications: ☐ One-time ☐ Other _____

- Type: ☐ Emergency ☐ Trial ☒ Programmatic ☐ Other _____

Product type: Herbicide ☐ Insecticide ☐ Fungicide ☒ Other GROWTH REGULATOR

Application: ☐ Ornamental Turf ☒ Golf ☐ Vector Control ☐ Park Tree ☐ Street Tree
☐ Right of Way ☐ Vertebrate pest ☐ Other _____

Is the pesticide on the *Tiered Materials List*? ☐ No Yes If yes, provide the Tier _____

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # _____ Signal _____ Estimated Tier _____

Restricted ☐ No ☐ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.
EXCESSIVE SEED HEAD GROWTH ON POA ANNUAL GRASS

Describe the management goals and objectives for this site.
BY ELIMINATION SEED PRODUCTION. THE BENTGRASS HAS A BETTER CHANCE OF COMPETING AGAINST THE POA. WHICH MEANS LESS FUNGICIDES APPLICATIONS IN FUTURE

What is the damage threshold for this pest at this site?
MINIMAL

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
N/A

Describe how the product would be applied including frequency, concentration, and method of application.
THE PRODUCT WOULD BE APPLIED ON A MONTHLY BASIS @ 5 OZ./1000 SQ' USING A SPRAYER. FIRST APPLICATION WOULD BE IN FEBRUARY LAST ONE WOULD BE IN APRIL

What non-target impacts are anticipated?
NONE

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. USING THIS PRODUCT WOULD REDUCE THE AMOUNT OF POA SEED GERMINATION. WHICH WOULD ALLOW THE BENTGRASS TO ENCROACH INTO THE POA GRASS AREAS. THE DESIRED GRASS IS THE BENTGRASS BECAUSE IT REQUIRES ONLY 10% OF FUNGICIDE APPLICATIONS WHEN COMPARED TO POA GRA

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How will the effectiveness of this product be monitored? Include expected results and indicators of success.
AFTER THE APPLICATION YOU LOOK FOR SEED DEVELOPMENT, WHEN NEW SEED STARTS TO DEVELOP USUALY ONE MONTH AFTER THE APPLICATION YOU MAKE YOUR NEXT APPLICAT

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
PUTING GREENS, NO RUN OFF CONCERNS

List alternatives considered, alternatives implemented and why they were eliminated.
BALANCED FERTILERS WERE APPLIED, MOWING HEIGHTS WERE SET AT DIFFERENT HEIGHTS, VERTICUTTING GREENS TO REMOVE SEED HEADS DIDN'T WORK
THIS PRODUCT WOULD ONLY BE USED WHEN ALL ALTERNATIVES ARE EXAUSTED

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
IF YOU TAKE NO ACTION, THE POA GRASS WILL END UP TAKING OVER THE BENTGRASS. AND MORE FUNGICIDE APPLICATIONS WILL BE NECESSARY TO MAINTAIN HEALTHY POA GRASS

Was outside expertise utilized? ☐ No ☒ Yes / Describe
EVERY SUPERINTENDENT IN THE AREA USES THIS CHEMICAL.
EVERY ONE ~~RECOM~~ RECOMENDS THE USE OF PROXY

Describe future plans to prevent using the chemical again.
INCREASING BENTGRASS POPULATION AND ELIMINATING POA

Signatures _____ _____
Department IPM Coordinator — City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ☐ Approved ☐ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept: Parks and Recreation **IPM Coordinator:** Santos Escobar **Phone:** (805)564-5464

Pesticide Applicator Name: Santa Barbara County Agricultural Commissioner's Office **Phone:** (805)681-5600

Pesticide Applicator Name: Acorn Landscape Management Co. **Phone:** (805)964-4900

Application Site: Various locations where Arundo donax has invaded **Specific Locations:** Hidden Valley Open Space and 601 Las Positas Rd. **Date(s):** Various 2013-2018

Product Name: Rodeo or AquaMaster **Active Ingredient:** Glyphosate 53.8%

Number of Applications: ❑ One-time **X Other:** Dependent on persistence of individual plants

Type: ❑ Emergency ❑ Trial **X Programmatic** ❑ Other _____

Product type: X Herbicide ❑ Insecticide ❑ Fungicide ❑ Other _____

Application: ❑ Ornamental ❑ Turf ❑ Golf ❑ Vector Control ❑ Park Tree ❑ Street Tree

❑ Right of Way ❑ Vertebrate pest **X Other:** Exotic, invasive plants

Is the pesticide on the *Tiered Materials List*? ❑ No **X Yes** **If yes, provide the Tier:** 2

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg #_____ Signal _____ Estimated Tier _____

Restricted ❑ No ❑ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistent _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

X Attach product label and MSDS to this form.

Describe the pest problem.
Arundo donax, also known as giant reed, is an invasive, exotic plant that causes negative impacts on creek habitat and ecological function. Arundo forms dense, monotypic stands that can prevent the natural recruitment of native vegetation, displace existing native habitat, and reduce food resources for wildlife.

Arundo can also pose increased fire and flooding risks to public safety. This species is very difficult to remove by hand or with machinery because small fragments can re-sprout and soil disturbance caused by these removal methods can lead to increased erosion of creek banks.

Describe the management goals and objectives for this site.
The goal is to completely eliminate arundo from the City's watersheds and increase native tree and shrub diversity and cover where arundo currently exists. Specific objectives include reducing the vegetative cover of arundo to 0 percent; increasing native tree canopy and shrub cover to 30 percent at the end of year one and to 65 percent in year two. Keeping other non-native invasive weeds out of the restoration site is another project goal, but will not include the use of herbicide. Instead, mulching and hand removal will ensure other invasive species do not take over the sites once arundo is removed.

What is the damage threshold for this pest at this site?
Any live arundo plant material will trigger removal action. Arundo has an extremely rapid growth rate and becomes increasingly difficult to remove once established, even when herbicides are used. It is anticipated that newly established arundo (meaning small plant fragments that have just sprouted but not extensively rooted) will be removed by hand and without the use of herbicide.

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
Creeks Division staff conducted detailed arundo surveys of the Mission and Sycamore watersheds in spring 2008. An initial survey of the Arroyo Burro watershed was conducted in late-2007.

The Creeks Planner has consulted with the Weed Management Area Coordinator David Chang and local and regional arundo removal contractors to identify the most successful arundo control methods. He has also attended a scientific conference where the nation's leading arundo experts presented the latest findings on arundo's ecological impacts and control methods.

Arundo has been eradicated successfully at sites within the City under the previously granted programmatic exemption for glyphosate. Since arundo grows back rapidly after being cut, contracted staff used glyphosate (Aquamaster) to control arundo near Mission Creek, Arroyo Burro, Sycamore Creek, and the Santa Barbara Zoo. An exemption was also granted for glyphosate use during the Arroyo Burro Estuary restoration project in 2006 and the method proved very successful. Currently, no arundo is growing within the restoration project. New arundo plants that wash down from higher in the watershed are easily removed by hand before they can establish.

Describe how the product would be applied including frequency, concentration, and method of application.
Glyphosate would be applied using the "cut-stump-paint" method. This entails cutting each arundo stalk then immediately brushing or sponging on undiluted glyphosate. No surfactant would be used since the plant's phloem will be exposed when the stalk is cut, allowing direct entry of the herbicide into the plant tissue. Blue dye would be used in the herbicide solution to indicate treated stumps. The glyphosate brand name to be applied is Rodeo or AquaMaster. Both are approved by the California Department of Fish and Wildlife for riparian areas and aquatic environments. It is estimated that arundo would be treated once after initially cutting the plants and then 3-4 times over a two year period to treat individual re-sprouts.

Arundo would initially be treated in Mission and Arroyo Burro watersheds in September and October 2013, and then retreated two to five times total during the following four years.

What non-target impacts are anticipated?
The painting or brushing of glyphosate on freshly cut stumps will minimize pesticide drift to the maximum extent possible. Blue dye will lessen the amount of excess application of herbicide and accidental contact with treated stumps.

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.
This is a curative method since the arundo already exists on these sites and the management goal is complete arundo removal. Glyphosate allows treatment of arundo without extensive use of hand tools and heavy machinery, which typically lead to increased creek bank instability and soil erosion. Using limited and strategic application of herbicides will allow the dead root mass of arundo to stay in place to add to bank stability. Control of arundo will achieve site management goals by reducing non-native plant cover and allowing for better growth of native plants.

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
Short-term success will be measured using visual observations of the site to determine if the target weed species has been eradicated from the site. No re-growth of the target species will be considered a success. Long-term success will be measured by the amount of native plant cover and diversity.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
Some of the sites on Arroyo Burro and Mission Creek are difficult to access and are often surrounded by poison oak or thorny blackberry vines. These sites occur within 20 feet of the creek so special precautions to reduce erosion will be taken, including the use of erosion control materials and mulching. The cut-stump-paint method will reduce the amount of pesticide drift.

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List alternatives considered, alternatives implemented and why they were eliminated.
Mechanical/hand removal: this creates excessive soil disturbance and compaction (if back-hoes are used), increases erosion, and could potentially damage nearby tree roots.

Mowing: arundo grows back rapidly after being mowed.

Tarping: tarps are often torn and punctured, rendering them ineffective, when used on arundo. The cut stumps of arundo contribute to damaging the tarps.

Spraying herbicide: the potential for herbicide drift and impacts to adjacent vegetation is too great in these confined locations.

Biocontrol: no control agents are available at this time.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
The application of glyphosate on arundo allows soil erosion and disturbance to be minimized. There are no known less-hazardous chemicals that will kill arundo since it is able to re-sprout vigorously from the rhizome and stem fragments. By taking no action, the arundo will most likely spread further and create larger fire and flooding risks, and likely lead to more native habitat being invaded and displaced.

Was outside expertise utilized? ❑ No X Yes / Describe:

Alternative techniques for weed control as well as advice for glyphosate application were taken from the University of California Statewide Integrated Pest Management Program, UCSB River Lab – Dr. Tom Dudley, Santa Barbara County Weed Management Area – David Chang, Channel Islands Restoration – Ken Owen and Duke McPherson, the California Invasive Plant Council, and from the 21 presentations at the Society for Weed Science's Arundo Symposium held in March 2008.

Describe future plans to prevent using the chemical again.

Visual inspection of the sites and creeks will ensure arundo will not reinvade and establish in the treated areas. Small individuals of arundo will be removed by hand before they are able to root.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Signatures_____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept: Parks and Recreation **IPM Coordinator:** Santos Escobar **Phone:** (805)564-5464

Pesticide Applicator Name: Santa Barbara County Agricultural Commissioner's Office **Phone:** (805)681-5600

Pesticide Applicator Name: Acorn Landscape Management Co. **Phone:** (805)964-4900

Application Site: Various locations where Arundo donax has invaded **Specific Locations:** Hidden Valley Open Space and 601 Las Positas Rd. **Date(s):** Various 2013-2018

Product Name: Polaris **Active Ingredient:** Imazapyr 27.7%

Number of Applications: ❑ One-time **X Other:** Dependent on persistence of individual plants

Type: ❑ Emergency ❑ Trial **X Programmatic** ❑ Other _____

Product type: X Herbicide ❑ Insecticide ❑ Fungicide ❑ Other _____

Application: ❑ Ornamental ❑ Turf ❑ Golf ❑ Vector Control ❑ Park Tree ❑ Street Tree
❑ Right of Way ❑ Vertebrate pest **X Other:** Exotic, invasive plants

Is the pesticide on the *Tiered Materials List*? **X** No ❑ **Yes** **If yes, provide the Tier:**

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg #228-534 Signal: Caution Estimated Tier: 2

Restricted ❑ No ❑ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistent _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

X Attach product label and MSDS to this form.

Describe the pest problem.
Arundo donax, also known as giant reed, is an invasive, exotic plant that causes negative impacts on creek habitat and ecological function. Arundo forms dense, monotypic stands that can prevent the natural recruitment of native vegetation, displace existing native habitat, and reduce food resources for wildlife.

Arundo can also pose increased fire and flooding risks to public safety. This species is very difficult to remove by hand or with machinery because small fragments can re-sprout and soil disturbance caused by these removal methods can lead to increased erosion of creek banks.

Describe the management goals and objectives for this site.
The goal is to completely eliminate arundo from the City's watersheds and increase native tree and shrub diversity and cover where arundo currently exists. Specific objectives include reducing the vegetative cover of arundo to 0 percent; increasing native tree canopy and shrub cover to 30 percent at the end of year one and to 65 percent in year two. Keeping other non-native invasive weeds out of the restoration site is another project goal, but will not include the use of herbicide. Instead, mulching and hand removal will ensure other invasive species do not take over the sites once arundo is removed.

What is the damage threshold for this pest at this site?
Any live arundo plant material will trigger removal action. Arundo has an extremely rapid growth rate and becomes increasingly difficult to remove once established, even when herbicides are used. It is anticipated that newly established arundo (meaning small plant fragments that have just sprouted but not extensively rooted) will be removed by hand and without the use of herbicide.

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.
Creeks Division staff conducted detailed arundo surveys of the Mission and Sycamore watersheds in spring 2008. An initial survey of the Arroyo Burro watershed was conducted in late-2007 and a thorough inspection was conducted in 2013.

The Creeks Planner has consulted with the Weed Management Area Coordinator David Chang and local and regional arundo removal contractors to identify the most successful arundo control methods. He has also attended a scientific conference where the nation's leading arundo experts presented the latest findings on arundo's ecological impacts and control methods.

Arundo has been eradicated successfully at sites within the City under the previously granted programmatic exemption for glyphosate. Since arundo grows back rapidly after being cut, contracted staff used glyphosate (Aquamaster) to control arundo near Mission Creek, Arroyo Burro, Sycamore Creek, and the Santa Barbara Zoo. An exemption was also granted for glyphosate use during the Arroyo Burro Estuary restoration project in 2006 and the method proved very successful. Currently, no arundo is growing within the restoration project. New arundo plants that wash down from higher in the watershed are easily removed by hand before they can establish.

Describe how the product would be applied including frequency, concentration, and method of application.
Imazapyr would be applied using the "cut-stump-paint" method. This entails cutting each arundo stalk then immediately brushing or sponging on a 5% solution of imazapyr. No surfactant would be used since the plant's phloem will be exposed when the stalk is cut, allowing direct entry of the herbicide into the plant tissue. Blue dye would be used in the herbicide solution to indicate treated stumps. The imazapyr brand name to be applied is Polaris. It has been approved by the California Department of Fish and Wildlife for riparian areas and aquatic environments. It is estimated that arundo would be treated once after initially cutting the plants and then 2-3 times over a two year period to treat individual re-sprouts.

Arundo would initially be treated in Mission and Arroyo Burro watersheds in September and October 2013, and then retreated two to three times total during the following four years.

What non-target impacts are anticipated?
The painting or brushing of imazapyr on freshly cut stumps will minimize pesticide drift to the maximum extent possible. Blue dye will lessen the amount of excess application of herbicide and accidental contact with treated stumps.

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.
This is a curative method since the arundo already exists on these sites and the management goal is complete arundo removal. Imazapyr allows treatment of arundo without extensive use of hand tools and heavy machinery, which typically lead to increased creek bank instability and soil erosion. Using limited and strategic application of herbicides will allow the dead root mass of arundo to stay in place to add to bank stability. Control of arundo will achieve site management goals by reducing non-native plant cover and allowing for better growth of native plants.

How will the effectiveness of this product be monitored? Include expected results and indicators of success.
Short-term success will be measured using visual observations of the site to determine if the target weed species has been eradicated from the site. No re-growth of the target species will be considered a success. Long-term success will be measured by the amount of native plant cover and diversity.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.
Some of the sites on Arroyo Burro and Mission Creek are difficult to access and are often surrounded by poison oak or thorny blackberry vines. These sites occur within 20 feet of the creek so special precautions to reduce erosion will be

taken, including the use of erosion control materials and mulching. The cut-stump-paint method will reduce the amount of pesticide drift.

List alternatives considered, alternatives implemented and why they were eliminated.
Mechanical/hand removal: this creates excessive soil disturbance and compaction (if back-hoes are used), increases erosion, and could potentially damage nearby tree roots.

Mowing: arundo grows back rapidly after being mowed.

Tarping: tarps are often torn and punctured, rendering them ineffective, when used on arundo. The cut stumps of arundo contribute to damaging the tarps.

Spraying herbicide: the potential for herbicide drift and impacts to adjacent vegetation is too great in these confined locations.

Biocontrol: no control agents are available at this time.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.
The application of imazapyr on arundo allows soil erosion and disturbance to be minimized. There are no known less-hazardous chemicals that will kill arundo since it is able to re-sprout vigorously from the rhizome and stem fragments. By taking no action, the arundo will most likely spread further and create larger fire and flooding risks, and likely lead to more native habitat being invaded and displaced.

Was outside expertise utilized? ❑ No X Yes / Describe:

Alternative techniques for weed control as well as advice for imazapyr application were taken from the University of California Statewide Integrated Pest Management Program, Santa Barbara County Weed Management Area – David Chang, Channel Islands Restoration – Kevin Thompson, Riparian Repairs – Bill Niell, the California Invasive Plant Council, and from the 21 presentations at the Society for Weed Science's Arundo Symposium held in March 2008.

Describe future plans to prevent using the chemical again.

Visual inspection of the sites and creeks will ensure arundo will not reinvade and establish in the treated areas. Small individuals of arundo will be removed by hand before they are able to root.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Signatures_____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City IPM Policy - Material Selection Criteria

Material: _Imazapyr_____

Tier Level Conclusion: _____2_____

Criteria	**Tier 1**	**Tier 2**	**Tier 3**		
EPA Categories	I - Danger	II or III, Warning or Caution	II or III, Warning or Caution		Warning
Restricted use	Yes	No	No		**No**
Prop 95	Yes	No	No		No
EPA Carcinogen	Known, likely or probable	Possible or EPA D	No evidence of carcinogenicity		No Evidence of carcingenicity
Endocrine Disruptor	Known or Probable	Suspect	No known, probable or suspect		None known
Environmental	Highly or extremely toxic to birds, aquatic species, bees or wildlife	Toxic or moderately toxic	Not toxic		Practically non-toxic
Persistence	Soil half lives greater than 100 days	Soil half lives less than 100 days but more than 30 days	Soil half lives less than 30 days		**Soil half life ranges from 2 weeks to 5 months**
Mobility	Rated high or very high, or label warning	Not high or very high, no label warnings	Not high or very high, no label warnings		
OMRI					
Cholinesterase inhibitor	-	-	-		
Dev or repro toxin	-	-	-		

SF Class _____

Seattle Class - _____

Ecological Criteria

EPA

	Toxic	Highly Toxic	Extremely Toxic
Birds	LD50 - 100 mg/kg LC50 - 500 ppm	NA	May result in fatalities
Aquatic	LC50 1ppm	NA	May result in fatalities
Bees	LD50 2-11 ug/bee (II)	LD50 - 2ug/bee (I)	
Other Wildlife and Animals	LD50 - 100 mg/kg	NA	May result in fatalities

EXTOXNET

	Practically Non-Toxic	Slightly Toxic	Moderately Toxic	Highly Toxic	Very Highly Toxic
Birds, LD50	>2,000	>500	>50	>10	< 10
Aquatic, LD50	>100	>10	>10	>.1	< .1
Bees	Few precautions		Kills if applied over them	Kills on contact for a few days	

According to the EPA-540-9-85-006
LC50 (mg/L) Category Description

<0.1 Very highly toxic
0.1 – 1 Highly toxic
1 – 10 Moderately toxic
10 –100 Slightly toxic
>100 Practically non-toxic

Nufarm

POLARIS®

Herbicide

Applications may be made for the control of undesirable emergent and floating aquatic vegetation in estuarine marine surface water. For the control of undesirable vegetation in fencerows, non-irrigation ditch banks, for establishment and maintenance of wildlife openings, grass pastures and rangeland, unimproved industrial noncropland Bermudagrass and Bahiagrass, under certain paved areas, and industrial noncropland areas including railroad, utility, pipeline and highway rights-of-way, utility plant sites, petroleum tank farms, pumping installations, storage areas, non-irrigation ditchbanks, roads, transmission lines, and industrial bareground areas.

ACTIVE INGREDIENT:	
Isopropylamine salt of Imazapyr: (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)*	27.7%
OTHER INGREDIENTS:	72.3%
TOTAL:	100.0%

*Equivalent to 22.62% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

Have the product container label with you when calling a poison control center or doctor or going for treatment.

EPA Reg. No. 228-534
EPA Est. No. 228-IL-1

Net Contents
2.5 Gal.
(9.46 L)

Manufactured for
Nufarm Americas Inc.
150 Harvester Drive
Burr Ridge, IL 60527

Nufarm

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

No human or domestic animal hazard statements are required. Follow instructions for Personal Protective Equipment and User Safety Recommendations.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Some materials are chemical resistant to this product are natural rubber ≥14 mils. If you want more options, follow the instructions for category A on the EPA chemical resistance category selection chart.

Mixers, loaders, applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Shoes plus socks.
- Chemical-resistant gloves for mixers and loaders, plus applicators using handheld equipment.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Pilots must use an enclosed cockpit that meet the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (6)].

USER SAFETY RECOMMENDATIONS

Users Should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

PHYSICAL AND CHEMICAL HAZARDS

Spray solutions of this product should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in unlined steel (except stainless steel) containers or spray tanks.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to plants. Drift and run off may be hazardous to plants in water adjacent to treated areas. Do not apply directly to water except as specified on the label. Treatment of aquatic weeds may result in oxygen depletion or loss due to decomposition of dead plants. Do not treat more than one half the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas. Do not contaminate water when disposing of equipment washwater or rinsate. See Directions for Use for additional precautions and requirements.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Do not use on food crops or Christmas trees. Keep from contact with fertilizers, insecticides, fungicides and seeds. Do not drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the treated soil may be washed or moved into contact with their roots. Do not side trim desirable vegetation with this product unless severe injury and plant death can be tolerated. Prevent drift of spray to desirable plants.

Clean application equipment after using this product by thoroughly flushing with water.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material
- Protective eyewear

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Noncrop weed control is not within the scope of the Worker Protection Standard. See the PRODUCT INFORMATION section of this label for a description of noncrop sites.

DO NOT enter or allow others to enter treated areas until sprays have dried.

USE PRECAUTIONS AND RESTRICTIONS

Applications may only be made for the control of undesirable emergent and floating aquatic vegetation in and around standing and flowing water, including estuarine and marine sites. Applications may be made to control undesirable wetland, riparian and terrestrial vegetation growing in or around surface water when applications may result in inadvertent applications to surface water.

Aerial application is restricted to fixed wing aircraft and to helicopter only. Only helicopters can be used for aquatic applications.

Application of this product can only be made by federal or state agencies, such as Water Management District personnel, municipal officials and the U.S. Army Corps of Engineers, or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the state or local government.

Treatment to other than non-native invasive species is limited to only those plants that have been determined to be a nuisance by a federal or state government entity.

Applications to private waters: Applications may be made to private waters that are still, such as ponds, lakes and drainage ditches where there is minimal or no outflow to public waters.

Application to public waters: Applications may be made to public waters such as ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, streams, rivers, and other slow-moving or quiescent bodies of water for control of aquatic weeds or for control of riparian and wetland weed species.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

Recreational Use of Water in Treatment Area: There are no restrictions on the use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock Use of Water in/from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Precautions for Potable Water Intakes: Do not apply this product directly to water within one-half mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within one-half mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within one-half mile of active potable water intakes, the water intake must be turned off during application and for a minimum of 48 hours after the application. These aquatic applications may be made only in the cases where there are alternative water sources or holding ponds, which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. Note: Existing potable water intakes which are no longer in use, such as those replaced by connections to wells or a municipal water system, are not considered to be active potable water intakes. This restriction does not apply to intermittent, inadvertent overspray of water in terrestrial use sites.

APPLICATION TO WATERS USED FOR IRRIGATION

Water treated with this product may not be used for irrigation purposes for 120 days after application or until product residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less.

Seasonal Irrigation Waters: This product may be applied during the off-season to surface waters that are used for irrigation on a seasonable basis, provided that there is a minimum of 120 days between product application and the first use of treated water for

irrigation purposes or until product residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less.

Irrigation Canals/Ditches: Do not apply this product to irrigation canals/ditches unless the 120-day restriction on irrigation water usage can be observed or product residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less. Do not apply this product to dry irrigation canals/ditches.

Quiescent or Slow Moving Waters: In lakes and reservoirs Do not apply this product within one (1) mile of an active irrigation water intake during the irrigation season. Applications less than one (1) mile from an inactive irrigation water intake may be made during the off-season, provided that the irrigation intake will remain inactive for a minimum 120 days after application or until product residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less.

Moving water: Do not apply within one-half mile downstream of an active irrigation water intake. When making applications upstream from an active irrigation water intake, the intake must be turned off for a period of time sufficient to allow the upstream portion of treated water to completely flow past the irrigation intake before use can resume. Shut off time will be determined by the speed of water flow and the distance and length of water treated upstream from the intake. Consult local, state and/or federal authorities before making any applications upstream from an active irrigation water intake.

PRODUCT INFORMATION

Aquatic Use Sites: This product is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control floating and emergent undesirable vegetation (see AQUATIC WEEDS CONTROLLED section and the ADDITIONAL WEEDS CONTROLLED section) in or near bodies of water which may be flowing, non-flowing, or transient. This product may be applied to specified aquatic sites that include lakes, rivers, streams, ponds, seeps, drainage ditches, canals, reservoirs, swamps, bogs, marshes, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites and seasonal wet areas. See AQUATIC USE section of this label for precautions, restrictions, and instructions on aquatic uses.

Read and observe the following directions if aquatic sites are present in terrestrial noncrop areas and are part of the intended treatment area.

Herbicidal Activity: This product will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. This product is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until two or more weeks after application. Complete kill of plants may not occur for several weeks. Applications of this product are rainfast one hour after treatment.

This product does not control plants which are completely submerged or have a majority of their foliage under water.

Application Methods: This product must be applied to the emergent foliage of the target vegetation and has little to no activity on submerged aquatic vegetation. Product concentrations resulting from direct application to water are not expected to be of sufficient concentration or duration to provide control of target vegetation. Application should be made in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water. For maximum activity, weeds should be growing vigorously at the time of application and the spray solution should include a surfactant (See ADJUVANTS section for specific recommendations). This product may be selectively applied by using low-volume directed application techniques or may be broadcast-applied by using ground equipment, watercraft or by helicopter. In addition, this product may also be used for cut stump, cut stem and frill and girdle treatments within aquatic sites (see AERIAL APPLICATIONS and GROUND APPLICATIONS sections for additional details).

This product should be applied with surface or helicopter application equipment in a minimum of 5 gallons of water per acre. When applying by helicopter, follow directions under the AERIAL APPLICATIONS section of this label, otherwise refer to section on GROUND APPLICATIONS when using surface equipment.

Applications made to moving bodies of water should be made while traveling upstream to prevent concentration of this herbicide in water. Do not apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist.

When application is to be made to target vegetation that covers a large percentage of the surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. Do not treat more than one half of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas.

Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash for one hour after application.

Apply this product at 2 to 6 pints per acre depending on species present and weed density. Do not exceed the maximum label rate of 6 pints per acre (1.5 lb ai/A) per year. Use the higher labeled rates for heavy weed pressure. Consult the AQUATIC WEEDS CONTROLLED section and the ADDITIONAL WEEDS CONTROLLED section of this label for specific rates.

This product may be applied as a draw down treatment in areas described above. Apply this product to weeds after water has been drained and allow 14 days before reintroduction of water.

Terrestrial Use Sites: This product is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to grass pasture and rangeland and noncropland areas such as railroad, utility, pipeline and highway rights-of-way, utility plant sites,

petroleum tank farms, pumping installations, fence rows, storage areas, non-irrigation ditchbanks, including grazed or hayed areas within these sites. This product is used for the establishment and maintenance of wildlife openings. This product may also be used for the release of unimproved Bermudagrass (see specific directions) and for use under certain paved surfaces (see specific directions).

Application Methods: This product will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species and this product will provide residual control of labeled weeds which germinate in the treated areas. This product may be applied either preemergence or post-emergence to the weeds; however, post-emergence application is the method of choice in most situations, particularly for perennial species. For maximum activity, weeds should be growing vigorously at the time of post-emergence application and the spray solution should include a surfactant (See Adjuvant Section for specific recommendations). These solutions may be applied selectively by using low-volume techniques or may be applied broadcast by using ground equipment or aerial equipment. In addition, this product may also be used for stump and cut stem treatments (see specific directions).

Herbicidal Activity: This product is readily absorbed through leaves, stems, and roots and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground storage organs which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until two weeks after application. Complete kill of plants may not occur for several weeks. Applications of this product are rainfast one hour after treatment.

PRECAUTIONS FOR AVOIDING INJURY TO NON-TARGET PLANTS

Untreated desirable plants can be affected by root uptake of this product from treated soil. Injury or loss of desirable plants may result if this product is applied on or near desirable plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. When making applications along shorelines where desirable plants may be present, caution should be exercised to avoid spray contact with their foliage or spray application to the soil in which they are rooted. Shoreline plants that have roots that extend into the water in an area where this product has been applied generally will not be adversely affected by uptake of the herbicide from the water.

If treated vegetation is to be removed from the application site, Do not use the vegetative matter as mulch or compost on or around desirable species.

Untreated trees can occasionally be affected by root uptake of this product through movement into the top soil. Injury or loss of desirable trees or other plants may result if this product is applied on or near desirable trees or other plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots.

MANAGING OFF-TARGET MOVEMENT

The following information is provided as general guidance for managing off-target movement. Specific use for this product may differ depending on the application technique used and the vegetation management objective.

Spray Drift: Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determines the potential for spray drift. The applicator and the entity authorizing spraying are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications: 1) The distance of the outer most operating nozzles must not exceed 3/4 the length of the rotor. 2) Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be observed.

Spray drift from applying this product may result in damage to sensitive plants adjacent to the treatment area. Only apply this product when the potential for drift to these and other adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, or non-target crops) is minimal. Do not apply when the following conditions exist that increase the likelihood of spray drift from intended targets: high or gusty winds, high temperatures, low humidity, temperature inversions.

To minimize spray drift, the applicator should be familiar with and take into account the following drift reduction advisory information. Additional information may be available from state enforcement agencies or the Cooperative Extension on the application of this product.

The best drift management strategy and most effective way to reduce drift potential are to apply large droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see WIND, TEMPERATURE AND HUMIDITY, and TEMPERATURE INVERSIONS).

CONTROLLING DROPLET SIZE

- Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of Nozzles - Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is recommended practice. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift. Do not use nozzles producing a mist droplet spray.

APPLICATION HEIGHT
Making applications at the lowest possible height (helicopter, ground driven spray boom) that is safe and practical reduces exposure of droplets to evaporation and wind.

SWATH ADJUSTMENT
When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the treatment area, the applicator must compensate for this displacement by adjusting the path of the application equipment (e.g. aircraft, ground) upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller droplets, etc.).

WIND
Drift potential is lowest between wind speeds of 3-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY
When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

TEMPERATURE INVERSIONS
Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud, which can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

WIND EROSION
Avoid treating powdery dry or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

ADJUVANTS

Post-emergence applications of this product require the addition of a spray adjuvant for optimum herbicide performance. Only spray adjuvants that are approved or appropriate for aquatic use should be utilized. The addition of a Chemical Producers and Distributors Associations (CPDA) certified adjuvant can increase control. A CPDA certified drift control agent may also be used.

Nonionic Surfactants: Use a nonionic surfactant at the rate 0.25% v/v or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with a HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product (alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements).

Methylated Seed Oils or Vegetable Oil Concentrates: Instead of a surfactant, a methylated seed oil or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, methylated seed oil or vegetable based seed oil concentrates should be mixed at a rate of 1 % of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in product deposition and uptake by plants under moisture or temperature stress.

Silicone Based Surfactants: See manufacturer's label for specific rate recommendations. Silicone-based surfactants may reduce the surface tension of the spray droplet, allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

Invert emulsions: This product can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray run-off, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

Fertilizer/Surfactant Blends: Nitrogen based liquid fertilizers such as 28%N, 32%N, 10-34-0 or ammonium sulfate, may be added at the rate of 2 to 3 pints per acre in combination with the recommended rate of nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate. The use of fertilizers in a tank mix without a nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate is not recommended.

Other: An antifoaming agent, spray pattern indicator or drift reducing agent may be applied at the product labeled rate if necessary or desired.

TANK MIXES

This product may be tank-mixed with other herbicides provided that the label for the tank mix product does not prohibit such mixing.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the more restrictive label when making an application involving tank-mixes.

AERIAL APPLICATIONS

All restrictions must be taken to minimize or eliminate spray drift. Both helicopter and fixed wing aircraft can be used to apply this product, but applications to aquatic sites are restricted to helicopter only. Do not make applications by helicopter or fixed wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area, or when spray drift as a result of helicopter application can be tolerated.

Uniformly apply the specified amount of this product in 2 to 30 gallons of water per acre. A foam reducing agent may be added at the specified label rate.

Immediately after each use of this product thoroughly clean application equipment, including landing gear. Uncoated steel surfaces (except stainless steel surfaces) may result in corrosion and failure after prolonged exposure to the product. The maintenance of an paint (organic coating) may prevent corrosion.

Aerial Applications Restrictions:

1. Applicators are required to use a Coarse or Coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet; Applicators are required to use a Very Coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet; Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
2. Applicators are required to use upwind swath displacement.
3. The boom length must not exceed 60% of the wingspan or 90% of the rotor blade diameter to reduce spray drift.
4. Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited.
5. Applications into temperature inversions are prohibited.
6. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a Microfoil boom, Thru-Valve boom or raindrop nozzles, must be used and calibrated. Except when applying with a Microfoil boom, a drift control agent may be added at the recommended label rate.

GROUND APPLICATION (BROADCAST)

FOLIAR APPLICATIONS

Low Volume Foliar:

Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.5 to 5% of this product plus surfactant (see the ADJUVANTS section of this label for specific recommendations). A foam reducing agent may be applied at the recommended label rate, if needed. For control of difficult species (see AQUATIC WEEDS CONTROLLED section and the TERRESTRIAL WEEDS CONTROLLED section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes but do not apply more than 6 pints of this product per acre. Excessive wetting of foliage is not recommended. See the MIXING GUIDE below for some suggested volumes of this product and water.

For low volume, select proper nozzles to avoid over-application. Proper application is critical to ensure desirable results. Best results are achieved when the spray covers the crown and approximately 70% of the plant. The use of an even flat fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Recommended tip sizes include 4004E, or 1504E. For a straight stream and cone pattern, adjustable cone nozzles such as 5500 X3 or 5500 X4 may be used. Attaching a rollover valve onto a Spraying Systems Model 30 gunjet or other similar spray guns allows for the use of both a flat fan and cone tips on the same gun.

Moisten, but do not drench target vegetation causing spray solution to run off.

Low Volume Foliar with Backpacks:

For low-growing species, spray down on the crown, covering crown and penetrating approximately 70% of the plant.

For target species 4 to 8 feet tall, swipe the sides of target vegetation by directing spray to at least two sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For target species over 8 feet tall, face sides of the target vegetation by directing spray to at least two sides of the target in smooth zigzag motions from crown to bottom.

Low Volume Foliar with Hydraulic Handgun Application Equipment:

Use same technique as described above for Low Volume Foliar with Backpacks.

For broadcast applications, simulate a gentle rain near the top of target vegetation, allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution which contacts the understory may result in severe injury or death of plants in the understory.

SPRAY SOLUTION MIXING GUIDE FOR LOW-VOLUME FOLIAR APPLICATIONS

AMOUNT OF SPRAY SOLUTION BEING PREPARED	DESIRED CONCENTRATION (fluid volume)				
	0.5%	0.75%	1%	1.5%	5%
	(amount of product to use)				
1 gallon	0.6 fl. oz.	0.9 fl. oz.	1.3 fl. oz.	1.9 fl. oz.	6.5 fl. oz.
3 gallons	1.9 fl. oz.	2.8 fl. oz.	3.8 fl. oz.	5.8 fl. oz.	1.2 pint
4 gallons	2.5 fl. oz.	3.8 fl. oz.	5.1 fl. oz.	7.7 fl. oz.	1.6 pint
5 gallons	3.2 fl. oz.	4.8 fl. oz.	6.5 fl. oz.	9.6 fl. oz.	2 pints
50 gallons	2 pints	3 pints	4 pints	6 pints	10 quarts
100 gallons	4 pints	6 pints	8 pints	6 quarts	5 gallons
2 Tablespoons = 1 fluid ounce					

High Volume Foliar:
For optimum performance when spraying medium to high-density vegetation and brush, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray run-off, causing increased ground cover injury, and injury to desirable species. To prepare the spray solution, thoroughly mix this product in water and add a surfactant (see ADJUVANT section for specific recommendations and rates of surfactants). A foam-reducing agent may be added at the recommended label rate, if needed. For control of difficult species (see AQUATIC WEEDS CONTROLLED section and the ADDITIONAL WEEDS CONTROLLED section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but do not apply more than 6 pints of this product per acre in aquatic and non-cropland sites and 3 pints pr acre in pasture and rangeland sites. Uniformly cover the foliage of the vegetation to be controlled but do not apply to run-off. Excessive wetting of foliage is not recommended.

Side Trimming:
Do not side trim with this product unless severe injury or death of the treated tree can be tolerated. This product is readily translocated and can result in death of the entire tree.

Ground Boom Applications Restrictions:
1. Applicators are required to use a nozzle height below 4 feet above the plant canopy or the ground and coarse or Coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
2. Applications with wind speeds greater than 10 mph are prohibited.
3. Applications into temperature inversions are prohibited.

CUT SURFACE TREATMENTS

This product may be used to control undesirable woody vegetation by applying the product solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of the target woody vegetation. Applications can be made at any time of the year except during periods of heavy sap flow in the spring. Do not over apply solution causing run-off from the cut surface.

Injury may occur to desirable woody plants if the shoots extend from the same root system or their root systems are grafted to those of the treated tree.

Mixing: This product may be mixed as either a concentrated or dilute solution for stump and cut stem treatments. The dilute solution may be used for applications to the surface of the stump or to cuts on the stem of the target woody vegetation. Concentrated solutions may be used for applications to cuts on the stem. Use of the concentrated solution permits application to fewer cuts on the stem, especially for large diameter trees. Follow the application instructions to determine proper application techniques for each type of solution.

- To prepare a dilute solution, mix 8 to 12 fluid ounces of this product with one gallon of water. If temperatures are such that freezing of the spray mixture may occur, antifreeze (ethylene glycol) may be used according to manufacturer's label to prevent freezing. The use of a surfactant or penetrating agent may improve uptake through partially callused cambiums.
- To prepare a concentrated solution, mix 2 quarts of this product with no more than 1 quart of water.

Cut stump treatments:
- Dilute Solution - Spray or brush the solution onto the cambium area of the freshly cut stump surface. Insure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

Cut stem (injection, hack & squirt) treatments:
- Dilute Solutions- Using standard injection equipment, apply 1 milliliter of solution at each injection site around the tree with no more than one-inch intervals between cut edges. Insure that the injector completely penetrates the bark at each injection site.
- Concentrate Solutions- Using standard injection equipment, apply 1 milliliter of solution at each injection site. Make at least one injection cut for every 3 inches of Diameter at Breast Height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than one injection site place the injection cuts at approximately equal intervals around the tree.

Frill or girdle treatments:

- Using a hatchet, machete, or chain saw, make cuts through the bark and completely around the tree to expose the cambium. The cut should angle downward extending into the cambium enough to expose at least two growth rings. Using a spray applicator or brush, apply a 25% to 100% solution of this product into each cut until thoroughly wet. Avoid applying so much herbicide that runoff to the ground or water occurs.

NONCROPLAND USES

When applied as directed and under the conditions described applications may be made for the control of undesirable vegetation growing in the following areas: airfields; airports; alleys, lanes, trails & access roads; around commercial or industrial structures or outbuildings; around farm and ranch structures and outbuildings; around ornamental gardens; around ornamental trees & shrubs; bare ground; beaches; campgrounds; construction sites; ditch banks; drive-in theaters; driveways & ramps; dry ditches & canals; fences & fencerows; firebreaks; gravel yards; habitat restoration & management areas; highways & roadsides (including aprons, medians, guardrails & right of ways); industrial plant sites; industrial areas; lumber yards; mulched areas; natural areas; paths and trails; parking areas; parks; paved areas; petroleum & other tank farms; pumping installations; pipeline, power, telephone & utility rights-of-way; power stations; preplant to turf & ornamental plants; railroad rights-of way; recreation areas; refineries; resorts; schools; sidewalks; sports areas; storage areas; substations; tennis courts; uncropped farmstead areas; uncultivated non-agricultural areas; vacant lots; walkways; wastelands; & wildlife habitat areas.

This product may also be used for the establishment and maintenance of wildlife openings, for the release of unimproved Bermudagrass and Bahiagrass, for bareground weed control, and for under certain paved surfaces. Applications to noncropland areas are not applicable to treatment of commercial timber or other plants grown for sale or other commercial use, or for commercial seed production, or for research purposes.

TANK-MIXES AND APPLICATION RATES FOR LOW VOLUME FOLIAR CONTROL*

Target Vegetation	Rate of this product	Tank Mix
Mixed hardwoods without elm, locust, or pine	1.0 - 1.5% by volume	Surfactant
Mixed hardwoods containing elm, locust, and pine	0.5 - 1.0% by volume	Accord® at 2 - 3% by volume plus surfactant
Mixed hardwoods with locust and pine but no elm	0.5 - 1.0% by volume	krenite at 2 - 5% by volume plus surfactant
Mixed hardwoods with locust and elm but no pine	0.5 - 1.0% by volume	Escort® at 2 oz./Acre or 2.3 grams/gal. plus surfactant

* Tank-Mixes with 2,4-D or products containing 2,4-D have resulted in reduced efficacy of this product.

MIXING CHART

% Solution	Amount of this product per Gallon of Mix	Amount of this product per 4 Gallon Backpack
0.5 %	0.6 fl. oz.	2.6 fl. oz.
1.0%	1.3 fl. oz.	5.1 fl. oz.
2.0%	2.6 fl. oz.	10.2 fl. oz.
3.0%	3.8 fl. oz.	15.4 fl. oz.
5.0%	6.4 fl. oz.	25.6 fl. oz.

MEASURING CHART		
128 fluid ounces	=	1 gallon
16 fluid ounces	=	1 pint
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 pints	=	1 quart

FOR CONTROL OF UNDESIRABLE WEEDS IN UNIMPROVED BERMUDAGRASS AND BAHIAGRASS AND OTHER NON-CROPLAND INDUSTRIAL SITES

This product may be used on unimproved industrial noncropland Bermudagrass and bahiagrass turf, roadsides and utility rights-of-way. The application of this product on established common and coastal Bermudagrass and bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the Bermudagrass and bahiagrass. Treatment of Bermudagrass with this product results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre with a spray pressure 20 to 50 psi.

IMPORTANT: Temporary yellowing of grass may occur when treatment is made after growth commences. DO NOT add surfactant in excess of the recommended rate (1 fl. oz. per 25 gallons of spray solution). DO NOT APPLY to grass during its first growing season. DO NOT APPLY to grass that is under stress from drought, disease, insects, or other causes.

DOSAGE RATES AND TIMING:

Bermudagrass - Apply this product at 6 to 12 fl. oz. per acre when the Bermudagrass is dormant. Apply this product at 6 to 8 fl. oz. per acre after the bermudagrass has reached full green-up. Applications made during green-up will delay green-up. Include a surfactant in the spray solution (See IMPORTANT statement above).

For additional pre-emergence control of annual grasses and small seeded broadleaf weeds, add Pendulum® Aquacap™ herbicide at the rate of 3.1 to 6.3 pints per acre. Consult the Pendulum® label for weeds controlled and for other use directions and precautions.

For control of Johnsongrass in bermudagrass turf, apply this product at 8 fl. oz. per acre plus Roundup® at 12 fl. oz. per acre plus surfactant. For additional control of broadleaves and vines, Tahoe® 3A or Garlon® 3A may be added to the above mix at the rate of 1-2 pints per acre. Observe all precautions and restrictions on the Tahoe® 3A, Garlon® 3A and Roundup® labels.

Bahiagrass - Apply this product at 4 to 8 fl. oz. per acre when the bahiagrass is dormant or after the grass has initiated green-up but has not exceeded 25% green-up. Include in the spray solution a surfactant (See Adjuvant section for specific recommendations on surfactants).

WEEDS CONTROLLED

Bedstraw *(Galium spp.)*
Bishopweed *(Ptilimnium capillaceum)*
Buttercup *(Ranunculus parviflorus)*
Carolina geranium *(Geranium carolinianum)*
Fescue *(Festuca spp.)*
Foxtail *(Setaria spp.)*
Little barley *(Hordeum pusillum)*
Seedling Johnsongrass *(Sorghum halepense)*
Wild carrot *(Daucus carota)*
White clover *(Trifolium repens)*
Yellow woodsorrel *(Oxalis stricta)*

GRASS GROWTH AND SEEDHEAD SUPPRESSION

This product may be used to suppress growth and seedhead development of certain turfgrass in unimproved areas. When applied to desirable turf, this product may result in temporary turf damage and/or discoloration. Effects to the desirable turf may vary with environmental conditions. For optimum performance, application should be made prior to culm elongation. Applications may be made before or after mowing. If applied prior to mowing, allow at least three days of active growth before mowing. If following a mowing, allow sufficient time for the grasses to recover before applying this product or injury may be amplified.

DO NOT APPLY to turf under stress (drought, cold, insect damaged, etc.) or severe injury or death may occur.

Bermudagrass - Apply this product at 6 to 8 fl. oz. per acre from early green-up to prior to seed head initiation. DO NOT add a surfactant for this application.

Cool Season Unimproved Turf - Apply this product at 2 fl. oz. per acre plus 0.25% nonionic surfactant. For increased suppression, this product may be tank-mixed with such products as Campaign® (24 fl. oz. per acre) or Embark® (8 fl. oz. per acre).

Tank-mixes may increase injury to desired turf. Consult each product label for recommended turf species and other use directions and precautions. Tank mixes with 2,4-D or products containing 2,4-D may decrease the effectiveness of this product.

TOTAL VEGETATION CONTROL WHERE BAREGROUND IS DESIRED

This product is an effective herbicide for preemergence or post-emergence control of many annual and perennial broadleaf and grass weeds where bareground is desired .This product is particularly effective on hard-to-control perennial grasses. This product at 1.5 to 6 pints per acre can be used alone or in tank-mix with herbicides approved for use in bare ground. The degree and duration of control are dependent on the rate of this product used, tank-mix partner, the volume of carrier, soil texture, rainfall and other conditions.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the more restrictive label when making an application involving tank-mixes.

TANK MIX RECOMMENDATIONS FOR BAREGROUND

Herbicide Rates per Acre*		
This product in Pints	Pendulum® 3.3 EC in Quarts	Diuron in Pounds a.i.
1.5 - 3	4.8	4 - 6
2 - 4	4.8	6 - 10
3 - 6	4.8	8 - 12

* Use higher rates for tall applications and in areas that have not been previously treated or that feature heavy infestations.

Applications of this product may be made anytime of the year. Use equipment calibrated to deliver desired gallons per acre spray volume and uniformly distribute the spray pattern over the treated area.

Post-emergence Applications: Always use a spray adjuvant (See Adjuvant section of this label) when making a post-emergence application. For optimum performance on tough to control annual grasses, applications should be made at a total volume of 100 gallons per acre or less. For quicker burndown or brown-out of target weeds, this product may be tank-mixed with products such as Razor®, or Roundup®. Tank mixes with 2,4-D or products containing 2,4-D may reduce the performance of this product. Always follow the more restrictive label when tank-mixing.

Spot Treatments: This product may be used as a follow-up treatment to control escapes or weed encroachment in a bareground situation. To prepare the spray solution, thoroughly mix in each gallon of water 0.5 to 5% of this product plus an adjuvant. For increased burndown include Razor®, Roundup® or similar products. For added residual weed control or to increase the weed spectrum, add Pendulum® Aquacap™ herbicide, Overdrive® herbicide or diuron. Always follow the more restrictive label when tank-mixing.

FOR CONTROL OF UNDESIRABLE WEEDS UNDER PAVED SURFACES

This product can be used under asphalt, pond liners and other paved areas, ONLY in industrial sites or where the pavement has a suitable barrier along the perimeter that prevents encroachment of roots of desirable plants.

This product should be used only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers or other vegetative plant parts are present in the site, they should be removed by scalping with a grader blade to a depth sufficient to insure their complete removal.

IMPORTANT: Paving should follow applications of this product as soon as possible. DO NOT apply where the chemical may contact the roots of desirable trees or other plants.

Injury or death of desirable plants may result if this product is applied where roots are present or where they may extend into the treated area. Roots of trees and shrubs may extend a considerable distance beyond the branch extremities or so-called drip line.

APPLICATION DIRECTIONS FOR PAVED SURFACES:

Applications should be made to the soil surface only when final grade is established. Do not move soil following application of this product. Apply this product in sufficient water (at least 100 gal. per acre) to ensure thorough and uniform wetting of the soil surface, including the shoulder areas. Add this product at a rate of 6 pints per acre (2.2 fluid ounce per 1000 square feet) to clean water in the spray tank during the filling operation. Agitate before spraying.

If the soil is not moist prior to treatment, incorporation of this product is needed for herbicide activation. This product can be incorporated into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. Do not allow treated soil to wash or move into untreated areas.

SPOT TREATMNETS AND CRACK –AND-CREVICE TREATMENTS:

Use this product as a follow up or initial treatment to control weed escapes or weed encroachment in bareground situations, including cracks and crevices in paved surfaces such as parking lots, paths, sidewalks, runways and roadways.

FOR SPOT TREATMENT WEED CONTROL IN GRASS PASTURE AND RANGELAND

For the control of undesirable vegetation in grass pasture and rangeland, this product may be applied as a spot treatment at a rate of 2 to 48 fluid ounces of product per acre using any of the ground application methods as described in this label. Spot applications may not exceed more than one tenth of the area to be grazed or cut for hay in grass pasture and rangeland. See appropriate sections of this label for specific use directions for the application method and vegetation control desired.

Do not apply more than 48 fluid ounces per acre per year.

Grazing and Haying Restrictions:

- Do not cut forage grass for hay for 7 days after application of this product.
- There are no grazing restrictions following application of this product.

Rangeland Use Instructions:

This product may be applied to rangeland for the control of undesirable vegetation to achieve one or more of the following vegetation management objectives:

- Control of undesirable (noxious, invasive and non-native) plant species.
- Control of undesirable vegetation for wildlife habitat improvement.
- Control of undesirable vegetation to aid in the establishment of desirable rangeland plant species.
- Release of existing desirable rangeland plant communities from the competitive pressure of undesirable plant species.
- Control of undesirable vegetation to aid in the establishment of undesirable vegetation following a fire.
- Control of undesirable vegetation to reduce wildfire fuel.

To ensure the protection of threatened and endangered plants, when applying this product to rangeland:

- Federal agencies must follow NEPA regulations to ensure protection of threatened and endangered plants.
- Other organizations or individuals must operate under a habitat conservation plan if threatened or endangered plants are known to be present on the land to be treated.
- State agencies must work with the Fish and Wildlife Service or the Service's designated state conservation agency to ensure protection of threatened and endangered plants.

See appropriate sections of this label for specific use directions for the desired rangeland vegetation management control desired.

This product must only be applied to a given rangeland acre as specific weed problems arise. Long-term control of undesirable weeds ultimately depends on the successful use of the land management practices that promote the sustainability and growth of desirable rangeland plant species.

ROTATIONAL CROP GUIDELINE

Rotational crops may be planted 12 months after applying this product at the specified pasture and rangeland rate. Twelve months after an application of this product, and before planting any crop, a successful field bioassay must be completed. The field bioassay consists of a test strip of the intended rotational crop planted in the previously treated area in the grass pasture and rangeland once grown to maturity. The test strip should include low areas and knolls, and include variations in soil type and pH within the treated area. If no crop injury is evident in the test strip, the intended rotational crop may be planted the following year.

Use of this product in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various agronomic factors and environmental factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible.

TERRESTRIAL WEEDS CONTROLLED

In terrestrial sites, this product will provide preemergence or post-emergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by preemergence or postemergence applications of this product. For established biennials and perennials postemergence applications of this product are recommended.

The rates shown below pertain to broadcast applications and indicate the relative sensitivity of these weeds. The relative sensitivity should be referenced when preparing low volume spray solutions (see "Low Volume" section of "Ground Applications"); low volume applications may provide control of the target species with less product per acre than is shown for the broadcast treatments. This product should be used only in accordance with the Directions for Use on this label.

The relative sensitivity of the species listed below can also be used to determine the relative risk of causing non-target plant injury if any of the below listed species are considered to be desirable within the area to be treated.

Resistant Biotypes: Naturally occurring biotypes (a plant within a given species that has a slightly different, but distinct genetic makeup from other plants of the same species) of some weeds listed on this label may not be effectively controlled. If naturally occurring resistant biotypes are present in an area, this product should be tank-mixed or applied sequentially with an appropriate registered herbicide having a different mode of action to ensure control.

GRASSES

COMMON NAME	SPECIES	GROWTH HABIT[2]
	Apply 2-3 pints per acre[1]	
Annual bluegrass	(*Poa annua*)	A
Broadleaf signalgrass	(*Brachiaria platyphylla*)	A
Canada bluegrass	(*Poa compressa*)	P
Downy brome	(*Bromus tectorum*)	A
Fescue	(*Festuca* spp.)	A/P
Foxtail	(*Setaria* spp.)	A
Italian ryegrass	(*Lolium multiflorum*)	A
Johnsongrass	(*Sorghum halepense*)	P
Kentucky bluegrass	(*Poa pratensis*)	P
Lovegrass	(*Eragrostis* spp.)	A/P
*Napier grass	(*Pennisetum purpureum*)	P
Orchardgrass	(*Dactylis glomerata*)	P
Paragrass	(*Brachiaria mutica*)	P
Quackgrass	(*Agropyron repens*)	P
Sandbur	(*Cenchrus* spp.)	A
Sand dropseed	(*Sporobulus cryptandrus*)	P
Smooth brome	(*Bromus inermis*)	P
Vaseygrass	(*Paspalum urvillei*)	P
Wild oats	(*Avena fatua*)	A
Witchgrass	(*Panicum capillare*)	A
	Apply 3-4 pints per acre[1]	
Barnyardgrass	(*Echinochloa crus-gali*)	A
Beardgrass	(*Andropogon* spp.)	P
Bluegrass, Annual	(*Poa annua*)	A
*Bulrush	(*Scirpus validus*)	P
Cheat	(*Bromus secalinus*)	A
Crabgrass	(*Digitaria* spp.)	A
Crowfootgrass	(*Dactyloctenium aegyptium*)	A
Fall panicum	(*Panicum dichotomiflorum*)	A
Giant Reed	(*Arundo donax*)	A
Goosegrass	(*Eleusine indica*)	A
Itchgrass	(*Rottboellia exaltata*)	A
Junglerice	(*Echinochloa colonum*)	A
Lovegrass	(*Eragrostis* spp.)	A
*Maidencane	(*Panicum hemitomon*)	A
Panicum, Browntop	(*Panicum fasciculatum*)	A
Panicum, Texas	(*Panicum texanum*)	A
Prairie threeawn	(*Aristida oligantha*)	P
Reed canarygrass	(*Phalaris arundinacea*)	P
Sandbur, Field	(*Cenchrus incertus*)	A
Signalgrass	(*Brachiaria platyphylla*)	A
Torpedograss	(*Panicum repens*)	P
Wild barley	(*Hordeum* spp.)	A
Wooly Cupgrass	(*Eriochloa villosa*)	A

GRASSES *(continued)*

COMMON NAME	SPECIES	GROWTH HABIT[2]
	Apply 4-6 pints per acre[1]	
Bahiagrass	(*Paspalum notatum*)	P
Bermudagrass[3]	(*Cynodon dactylon*)	P
Big bluestem	(*Andropogon gerardii*)	P
Cattail	(*Typha* spp.)	P
Cogongrass	(*Imperata cylindrica*)	P
Dallisgrass	(*Paspalum dilatatum*)	P
Feathertop	(*Pennisetum villosum*)	P
Guineagrass	(*Panicum maximum*)	P
Phragmites	(*Phragmites australis*)	P
Prarie cordgrass	(*Spartina pectinata*)	P
Saltgrass[3]	(*Distichlis stricta*)	P
Sand dropseed	(*Sporobolus cryptandrus*)	P
Sprangletop	(*Leptochloa* spp.)	A
Timothy	(Phleum pratense)	P
Wirestem muhly	(Muhlenbergia frondosa)	P

BROADLEAF WEEDS

COMMON NAME	SPECIES	GROWTH HABIT[2]
	Apply 2-3 pints per acre[1]	
Alligatorweed*	(*Alternanthera philoxeroides*)	A/P
Burdock	(*Arctium* spp.)	B
Goosegrass	(*Eleusine indica*)	A
Camphorweed	(*Heterotheca subaxillaris*)	P
Carolina geranium	(*Geranium carolinianum*)	A
Clover	(*Trifolium* spp.)	A/P
Common chickweed	(*Stellaria media*)	A
Common ragweed	(*Ambrosia artemisiifolia*)	A
Dandelion	(*Taraxacum officinale*)	P
Dog fennel	(*Eupatorium capillifolium*)	A
Filaree	(*Erodium* spp.)	A
Fleabane	(*Engeron* spp.)	A
Hoary vervain	(*Verbena stricta*)	P
Horseweed	(*Conyza canadensis*)	A
Indian mustard	(*Brassica juncea*)	A
Kochia	(*Kochia scoparia*)	A
Lambsquarters	(*Chenopodium album*)	A
*Lespedeza	(*Lespedeza* spp.)	P
Miners lettuce	(*Montia perfoliata*)	A
Mullein	(*Verbascum* spp.)	B
Nettleleaf goosefoot	(*Chenopodium murale*)	A
Oxeye daisy	(*Chrysanthemum leucanthemum*)	P
Pepperweed	(*Lepidium* spp.)	A
Pigweed	(*Amaranthus* spp.)	A

(continued)

BROADLEAF WEEDS *(continued)*

COMMON NAME	SPECIES	GROWTH HABIT[2]
Apply 2-3 pints per acre[1]		
Plantain	(*Plantago* spp.)	P
Puncturevine	(*Tribulus terrestris*)	A
Russian thistle	(*Salsola kali*)	A
Smartweed	(*Polygonum* spp.)	A/P
Sorrell	(*Rumex* spp.)	P
Sunflower	(*Helianthus* spp.)	A
Sweet clover	(*Melilotus* spp.)	A/B
Tansymustard	(*Descurainia pinnata*)	A
Western ragweed	(*Ambrosia psilostachya*)	P
Wild carrot	(*Daucus carota*)	B
Wild lettuce	(*Lactuca* spp.)	A/B
Wild parsnip	(*Pastinaca sativa*)	B
Wild turnip	(*Brassica campestris*)	B
Woollyleaf bursage	(*Franseria tomentosa*)	P
Yellow woodsorrel	(*Oxalis stricta*)	P
Apply 3-4 pints per acre[1]		
Broom snakeweed[4]	(*Gutierrezia sarothrae*)	P
Bull thistle	(*Cirsium vulgare*)	B
Burclover	(*Medicago* spp.)	A
Chickweed, Mouseear	(*Cerastium vulgatum*)	A
Clover, Hop	(*Trifolium procumbens*)	A
Cocklebur	(*Xanthium strumarium*)	A
Cudweed	(*Gnaphalium* spp.)	A
Desert Camelthorn	(*Alhagi pseudalhagi*)	P
Diffuse knapweed	(*Centaurea diffusa*)	A
Dock	(*Rumex* spp.)	P
Fiddleneck	(*Amsinckia intermedia*)	A
Goldenrod	(*Solidago* spp.)	P
Henbit	(*Lamium aplexicaule*)	A
Knotweed, prostrate	(*Polygonum aviculare*)	A/P
Pokeweed	(*Phytolacca americana*)	P
Purple loosestrife	(*Lythrum salicaria*)	P
Purslane	(*Portulaca* spp.)	A
Pusley, Florida	(*Richardia scabra*)	A
Rocket, London	(*Sisymbrium irio*)	A
Rush skeletonweed[4]	(*Chondrilla juncea*)	B
Saltbush	(*Atriplex* spp.)	A
Shepherd's-purse	(*Capsella bursa-pastoris*)	A
Spurge, Annual	(*Euphorbia* spp.)	A
Stinging nettle[4]	(*Urtica dioica*)	P
Velvetleaf	(*Abutilon theophrasti*)	A
Yellow starthistle	(*Centaurea solstitialis*)	A
Apply 4-6 pints per acre[1]		
Arrowweed	(*Pluchea sericea*)	A
Canada thistle	(*Cirsium arvense*)	P

BROADLEAF WEEDS *(continued)*

COMMON NAME	SPECIES	GROWTH HABIT[2]
Apply 4-6 pints per acre[1]		
Giant ragweed	(*Ambrosia trifida*)	A
Grey rabbitbrush	(*Chrysothamnus nauseosus*)	P
Little mallow	(*Malva parviflora*)	B
Milkweed	(*Asclepias* spp.)	P
Primrose	(*Oenothera kunthiana*)	P
Russian knapweed	(*Centaurea repens*)	P
Silverleaf nightshade	(*Solanum eleagnifolium*)	P
Sowthistle	(*Sonchus* spp.)	A
Texas thistle	(*Cirsium texanum*)	P

VINES AND BRAMBLES

COMMON NAME	SPECIES	GROWTH HABIT[2]
Apply 1 pint per acre		
Field bindweed	(*Convolvulus arvensis*)	P
Hedge bindweed	(*Calystegia sepium*)	A
Apply 2-3 pints per acre[1]		
Wild buckwheat	(*Polygonum convolvulus*)	P
Apply 3-4 pints per acre[1]		
Greenbriar	(*Smilax* spp.)	P
Honeysuckle	(*Lonicera* spp.)	P
Morningglory	(*Ipomoea* spp.)	A/P
Poison ivy	(*Rhus radicans*)	P
Redvine	(*Brunnichia cirrhosa*)	P
Wild rose	(*Rosa* spp.)	P
Including: Multiflora rose	(*Rosa multiflora*)	P
McCartney rose	(*Rosa bracteata*)	P
Apply 4-6 pints per acre[1]		
Blackberry	(*Rubus* spp.)	P
Dewberry	(*Rubus* spp.)	P
'Kudzu'[3]	(*Pueraria lobata*)	P
Trumpetcreeper	(*Campsis radicans*)	P
Virginia creeper	(*Parthenocissus quinquefolia*)	P
Wild grape	(*Vitis* spp.)	P

BRUSH SPECIES

COMMON NAME	SPECIES	GROWTH HABIT[2]
Apply 4-6 pints per acre[1]		
American beech	(*Fagus grandifolia*)	P
Ash	(*Fraxinus* spp.)	P
Bald cypress	(*Taxodium distichum*)	P
Bigleaf maple	(*Acer macrophylum*)	P
Black locust[5]	(*Robinia pseudoacacia*)	P

(continued)

BRUSH SPECIES *(continued)*

COMMON NAME	SPECIES	GROWTH HABIT[2]
	Apply 4-6 pints per acre[1]	
Blackgum	*(Nyssa sylvatica)*	P
Boxelder	*(Acer negundo)*	P
Brazilian peppertree	*(Schinus terebinthifolius)*	P
Cherry	*(Prunus spp.)*	P
Chinaberry	*(Melia azadarach)*	P
Chinese tallowtree	*(Sapium sebiferum)*	P
Dogwood	*(Cornus spp.)*	P
Elm[6]	*(Ulmus spp.)*	P
Hawthorn	*(Crataegus spp.)*	P
Hickory	*(Carya spp.)*	P
Honeylocust[5]	*(Gleditsia triacanthos)*	P
Maple	*(Acer spp.)*	P
Melaleuca	*(Melaleuca quiquenervia)*	P
Mulberry	*(Morus spp.)*	P
Oak	*(Quercus spp.)*	P
Persimmon	*(Diospyros virginiana)*	P
*Pine[5]	*(Pinus spp.)*	P
Poplar	*(Populus spp.)*	P
Privet	*(Ligustrum vulgare)*	P
Red Alder	*(Alnus rubra)*	P

BRUSH SPECIES *(continued)*

COMMON NAME	SPECIES	GROWTH HABIT[2]
	Apply 4-6 pints per acre[1]	
Red Maple	*(Acer rubrum)*	P
Rubber rabbitbrush	*(Chrysothamnus nauseaosus)*	P
Russian Olive	*(Eleagnus angustifolia)*	P
Sassafras	*(Sassafras albidum)*	P
Saltcedar	*(Tamarix ramosissima)*	P
Sourwood	*(Oxydendrum arboreum)*	P
Sumac	*(Rhus spp.)*	P
Sweetgum	*(Liquidambar styraciflua)*	P
*Water willow	*(Justica americana)*	P
Willow	*(Salix spp.)*	P
Yellow poplar	*(Liriodendron tulipifera)*	P

*Not approved for use in California

[1] The higher rates should be used where heavy or well-established infestations occur.

[2] Growth Habit - A = Annual, B = Biennial, P = Perennial

[3] Use a minimum of 75 GPA - Control of established stands may require repeat applications.

[4] For best results early postemergence applications are required

[5] Tank mix with glyphosate or triclopyr.

[6] Tank-mix with with glyphosate.

AQUATIC WEEDS CONTROLLED

This product may be applied for control of floating and emergent weeds (see Aquatic Weeds Controlled and Terrestrial Weeds Controlled) in or near bodies of water that may be nonflowing, flowing, or transient. This product may be applied to aquatic sites that include rivers, lakes, streams, seeps, drainage ditches, ponds, reservoirs, canals, bogs, marshes, swamps, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites, riparian sites and seasonal wet areas. See Use Precautions and Restrictions section of this label for instructions, directions, precautions and restrictions on aquatic uses.

Read and observe the following directions if aquatic sites are present in noncrop areas and are part of the intended treatment area.

This product must be applied to the emergent foliage of the target vegetation and little to no activity on submerged aquatic weeds. Concentration of this product, resulting from direct application to water, are not expected to be of sufficient concentration nor duration to control target vegetation. Application should be made in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water.

This product does not control plants that have a majority of their foliage underwater or plants that are completely submerged.

Product Application: This product should be applied with helicopter or surface application equipment in a minimum of 2 gallons of water per acre. When applying by helicopter, follow directions under Aerial Application section of this label; when using surface equipment refer to the Ground Application section.

When applying this product to moving bodies of water applications should be made while traveling upstream to prevent concentration of this herbicide in water. Do not apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist.

Large Application Areas / O^2 Depletion: When application is to be made to target vegetation that covers a large percentage of surface area of impounded water, treating area in strips may avoid oxygen depletion from vegetation decay. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. If oxygen depletion is a concern, treat no more than 1/2 of the surface area of the water at a time. Wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms ability to move into untreated areas.

Avoid washoff of sprayed foliage by recreational boat backwash or spray boat for 1 hour after application.

Apply this product at 2 to 6 pits per acre depending on weed density and species present. Do not exceed the maximum label rate of 6 pints per acre (1.5 lbs ae per acre) per year. Use the higher labeled rate for heavy weed pressure. See Aquatic Weeds Controlled and Terrestrial Weeds Controlled sections for specific rates.

This product may be applied as a draw-down treatment in areas described in this label. Apply this product to weeds after water has been drained and allow 14 days before reintroduction of water.

AQUATIC WEEDS CONTROLLED

This product will control the following target species as specified in the Use Rates and Application Directions section of the table. Rate instructions are expressed in terms of product volume for broadcast applications and as a percent solution for directed applications including spot treatments. For percent solution applications, do not apply more than the equivalent of 6 pints of this product per acre. Not for aquatic use sites in the states of Massachusetts and New York.

COMMON NAME	SCIENTIFIC NAME	USE RATES AND APPLICATION DIRECTIONS
Floating Species		
*Duckweed	*Lemna minor*	2-3 pints/acre (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Duckweed, Giant	*Spirodela polyriza*	2-3 pints/acre (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Frogbit	*Limnobium spongia*	1-2 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Spatterdock	*Nuphar luteum*	Apply a tank-mix of 2-4 pints/acre of this product + 4-6 pints/acre glyphosate (0.5% this product + 1.5% glyphosate) in 100 GPA water for best control. Ensure 100% coverage of actively growing, emergent foliage.
*Water Hyacinth	*Eichhornia crassipes*	1-2 pints/acre (0.5% solution) applied in 100 GPA water to actively growing foliage.
*Water Lettuce	*Pistia stratiotes*	1-2 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
Emerged Species		
*Alligatorweed	*Alternanthera philoxeroides*	1-4 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage. Tank-mix with glyphosate is NOT recommended, and may reduce alligatorweed control requiring higher product rates.
*Arrowhead, Duck-potato	*Sagittaria* spp.	1-2 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Bacopa, lemon	*Bacopa* spp.	1-2 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Parrot feather	*Myriophyllum aquaticum*	Must be foliage above water for sufficient product uptake. Apply 2-4 pints to actively growing emergent foliage.
*Pennywort	*Hydrocotyle* spp.	1-2 pints/acre (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Pickerelweed	*Pontederia cordata*	2-3 pints/acre (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Taro, wild; Dasheen; Elephant's Ear; Coco Yam	*Colocasia esculentum*	4-6 pints/acre (1.5% solution) applied in 100 GPA with a high quality 'sticker' adjuvant. Ensure good coverage of actively growing, emergent foliage.
*Water lily	*Nymphaea odorata*	2-3 pints/acre (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing, emergent foliage.
*Water primrose	*Ludwigia uruguayensis*	4-6 pints/acre (1.5% solution), ensure 100% coverage of actively growing emergent foliage. Tank-mix with glyphosate is NOT recommended and may reduce water primrose control.
Terrestrial/Marginal		
*Soda Apple, aquatic; Nightshade	*Solanum tampicense*	2 pints/acre applied to foliage
*Bamboo, Japanese	*Phyllostachys* spp.	3-4 pints/acre applied to the foliage when plant is actively growing. Before setting seed head. More foliage will result in greater herbicide uptake resulting in greater root kill.
Brazilian Pepper; Christmasberry	*Schinus terebinthifolius*	2-4 pints/acre applied to foliage

*Use not permitted in California unless otherwise directed by supplemental labeling.

(continued)

AQUATIC SPECIES CONTROLLED *(continued)*

COMMON NAME	SCIENTIFIC NAME	USE RATES AND APPLICATION DIRECTIONS
Terrestrial/Marginal *(continued)*		
Cattail	*Typha* spp.	2-4 pints (1% solution) applied to actively growing, green foliage after full leaf elongation. Lower rates will control cattail in the north; higher rates are needed in the south.
Chinese Tallow Tree	*Sapium sebiferum*	16-24 fluid ounces applied to foliage
Cogon Grass	*Imperata cylindrica*	Burn foliage, till area, that fall spray 2 quarts/acre this product + MSO applied to new growth.
Cordgrass, prairie	*Spartina* spp.	4-6 pints applied to actively growing foliage
*Cutgrass	*Zizaniopsis miliacea*	4-6 pints applied to actively growing foliage
*Elephant Grass; Napier Grass-	*Pennisetum purpureum*	3 pints/acre applied to actively growing foliage
*Flowering rush	*Butumu typla*	2-3 pints applied to actively growing foliage
Giant Reed, Wild Cane	*Arundo donax*	4-6 pints/acre applied in spring to actively growing foliage
*Golden Bamboo	*Phyllostachys aurea*	3-4 pints/acre applied to the foliage when plant is actively growing. Before setting seed head. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Junglerice	*Echinochloa colonum*	3-4 pints applied to actively growing foliage
Knapweeds	*Centaurea species*	Russian Knapweed - 2 to 3 pints + 1 quart/acre MSO fall applied after senescence begins
Knotweed, Japanese (see Fallopia japonica)	*Polygonum cuspidatum*	3-4 pints/acre applied postemergence to actively growing foliage
Melaleuca; Paperbark Tree	*Melaleuca quinquenervia*	For established stands, apply 6 pints/acre this product+ 6 pints/acre glyphosate + spray adjuvant. For best results use 4 quarts/A methylated seed oil as an adjuvant. For ground foliar application, uniformly apply to ensure 100% coverage. For broadcast foliar control, apply aerially in a minimum of two passes at 10 gallons/acre applied cross treatment. For spot treatment use a 25% this product + 25% solution of + glyphosate + 1.25% MSO in water applied as a frill or stump treatment.
*Nutgrass; Kili'p'opu	*Cyperus rotundus*	2 pints this product + 1 quart/acre MSO applied early postemergence
*Nutsedge	*Cyperus* spp.	2-3 pints postemergence to foliage or pre-emergence incorporated, non-incorporated preemergence applications will not control.
Phragmites; Common Reed	*Phragmites australis*	4-6 pints/acre applied to actively growing, green foliage after full leaf elongation, ensure 100% coverage. If stand has a substantial amount of old stem tissue, mow or burn, allow to regrow to approximately 5' tall before treatment. Lower rates will control phragmites in the north; higher rates are needed in the south.
*Poison Hemlock	*Conium maculatum*	2 pints this product + 1 quart/acre MSO applied preemergence to early postemergence to rosette, prior to flowering
Purple Loosestrife	*Lythrum salicaria*	1 pint/acre applied to actively growing foliage
Reed canarygrass	*Phalaris arundinacea*	3-4 pints/acre applied to actively growing foliage
Rose, swamp	*Rosa palustris*	2-3 pints/acre applied to actively growing foliage
Russian-Olive	*Elaeagnus angustifolia*	2-4 pints/acre or a 1% solution, applied to foliage
Saltcedar; Tamarisk	*Tamarix species*	Aerial apply 2 quarts this product + 0.25%v/v NIS applied to actively growing foliage during flowering. For spot spraying use 1% solution of this product + 0.25%v/v NIS and spray to wet foliage. After application wait at least two years before disturbing treated saltcedar. Earlier disturbance can reduce overall control.
Smartweed	*Polygonum* spp.	2 pints/acre applied early postemergence

*Use not permitted in California unless otherwise directed by supplemental labeling.

(continued)

AQUATIC SPECIES CONTROLLED *(continued)*

COMMON NAME	SCIENTIFIC NAME	USE RATES AND APPLICATION DIRECTIONS
Terrestrial/Marginal *(continued)*		
Sumac	*Rhus* spp.	2-3 pints/acre applied to foliage
Swamp Morning Glory; Water Spinach; Kangkong	*Ipomoea aquatica*	1-2 pints/acre this product + 1 quart/acre MSO applied early postemergence
Torpedo Grass	*Panicum repens*	4 pints/acre (1 - 1.5% solution), ensure good coverage to actively growing foliage.
*White Top; Hoary Cress	*Cardaria draba*	1-2 pints/acre applied in spring, to foliage, during flowering.
Willow	*Salix* spp.	2-3 pints/acre of this product applied to actively growing foliage, ensure good coverage.

*Use not permitted in California unless otherwise directed by supplemental labeling.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: DO NOT store below 10° F.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL:

Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

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If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

(RV081811)

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SPECIMEN

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Nufarm Polaris® Herbicide**
EPA Reg. No.: 228-534
Synonyms: Imazapyr, Isopropylamine Salt; IPA Salt of Imazapyr; 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridine-carboxylic acid, salt with 2-propanamine (1:1)
Product Type: Herbicide

Company Name: Nufarm Americas Inc.
150 Harvester Drive, Suite 200
Burr Ridge, IL 60527

Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, Call CHEMTREC Day or Night: 1-800-424-9300**
For Medical Emergencies Only, Call 1-877-325-1840

Date of Issue: June 20, 2012 **Supersedes:** January 14, 2008
Sections Revised: 2, 7, 13

2. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance and Odor: Blue colored liquid with a faint ammonia-like odor.
Warning Statements: Keep out of reach of children. CAUTION. Minimally toxic. Acute toxicity tests show very low potential for immediate risk in handling this product. Follow instructions for personal protective equipment and user safety recommendations.

Potential Health Effects:
Likely Routes of Exposure: Inhalation, eye and skin contact.
Eye Contact: Minimally irritating based on toxicity studies.
Skin Contact: Slightly toxic and slightly irritating based on toxicity studies.
Ingestion: Slightly toxic based on toxicity studies.
Inhalation: Low inhalation toxicity.
Medical Conditions Aggravated by Exposure: None known.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:
This pesticide is toxic to plants. Drift and runoff may be hazardous to plants in water adjacent to treated areas. Treatment of aquatic weeds can result in oxygen depletion due to decomposition of dead plants. Oxygen loss, if severe, can cause fish suffocation. This product is phytotoxic at extremely low concentrations. Non-target plants may be adversely affected from drift.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Isopropylamine Salt of Imazapyr	81510-83-0	27.7
Other Ingredients		72.3

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.
If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point: >212° F (>100° C) Pensky-Martens
Autoignition Temperature: Not determined **Flammability Limits:** Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon, hydrogen and nitrogen.

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 1 **Flammability:** 1 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:
Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash

thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Spray solutions of this product should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers. Do not mix, store or apply this product or spray solutions of this product in unlined steel (except stainless steel) containers or spray tanks.

Storage:
Do not store below 10° F. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:
Eye/Face Protection: Not normally required. To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.
Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves made of any waterproof material. An emergency shower or water supply should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	TWA	STEL	TWA	STEL	Unit
Isopropylamine Salt of Imazapyr	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Blue colored liquid with a faint ammonia-like odor.

Boiling Point:	Not determined	**Solubility in Water:**	Soluble
Density:	8.80 pounds/gallon	**Specific Gravity:**	1.057 @ 20°C
Evaporation Rate:	Not determined	**Vapor Density:**	Not determined
Freezing Point:	Not determined	**Vapor Pressure:**	Not determined
pH:	6.26 (1% solution)	**Viscosity:**	3.766 cst @ 20°C

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.
Conditions to Avoid: Excessive heat. Do not store near heat or flame.
Incompatible Materials: Oxidizing agents and reducing agents.
Hazardous Decomposition Products: Under fire conditions may produce gases such as oxides of carbon, hydrogen and nitrogen.
Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:
Data from laboratory studies on this product are summarized below:
Oral: Rat LD_{50}: >5,000 mg/kg (female)
Dermal: Rat LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.07 mg/L
Eye Irritation: Rabbit: Minimally irritating
Skin Irritation: Rabbit: Slightly irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: No adverse effects at approximately 1,700 mg/kg/day (highest dose tested).
Carcinogenicity / Chronic Health Effects: Imazapyr did not cause cancer in laboratory animals. EPA has classified imazapyr as a Group E (evidence of non-carcinogenicity for humans) carcinogen.
Reproductive Toxicity: The results of animal studies gave no indication of a fertility impairing effect.
Developmental Toxicity: No indications of a developmental toxic / teratogenic effect were seen in animal studies.
Genotoxicity: No mutagenic effect was found in various tests with microorganisms and mammals.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on Imazapyr:

96-hour LC_{50} Bluegill:	>100 mg/l	Bobwhite Quail 8-day Dietary LC_{50}:	>5,000 ppm
96-hour LC_{50} Rainbow Trout:	>100 mg/l	Bobwhite Quail Oral LD_{50}:	>2,150 mg/kg
48-hour EC_{50} Daphnia:	>100 mg/l	Mallard Duck 8-day Dietary LC_{50}:	>5,000 ppm
Honey Bee LD_{50}:	>100 mg/bee	Mallard Duck Oral LD_{50}:	>2,150 mg/kg

Environmental Fate:
Imazapyr is degraded by microbial metabolism and can be relatively persistent in soils. It has an average half-life in soils that ranges from 2 weeks to 5 months. Half-lives tend to be shorter in forest litter and soils. Imazapyr is water-soluble and variably binds to organic materials in the soils. Although the potential to leach is high, leaching is limited under typical field conditions. In water, imazapyr can be rapidly degraded by photolysis with a half-life averaging 2 days. Due to its rapid photodegradation by sunlight, water contamination by imazapyr is generally not of concern.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Handling and Disposal:
Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities. If burned, stay out of smoke.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT
Non Regulated – See 173.132(b)(3)

IMDG
Non Regulated - See IMDG 2.6.2.1.3

IATA
Non Regulated - See IATA 3.6.1.5.3

15. REGULATORY INFORMATION

U.S. Federal Regulations:

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Immediate

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
None

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not listed

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

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City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept: Parks and Recreation **IPM Coordinator:** Santos Escobar **Phone:** (805) 564-5464

Pesticide Applicator (employee or company) Name: To be determined **Phone:** (805) 563-8888

Application Site: Parma Park/Stanwood Rd. **Specific Location:** Olive Grove (Figure 1) **Date(s):** Fall (Sept–Nov) 2013

Product Name: AquaMaster **Active Ingredient:** Glyphosate (53.8%)

Number of Applications: ❑ One-time **X Other:** as needed for thorough eradication

Type: ❑ Emergency ❑ Trial X Programmatic ❑ Other _____

Product type: X Herbicide ❑ Insecticide ❑ Fungicide ❑ Other _____

Application: ❑ Ornamental ❑ Turf ❑ Golf ❑ Vector Control ❑ Park Tree ❑ Street Tree ❑ Right of Way ❑ Vertebrate pest **X Other:** Eradicate shrubs in 100 yr old olive orchard

Is the pesticide on the *Tiered Materials List*? ❑ No **X Yes** **If yes, provide the Tier:** 2

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg #_____ Signal _____ Estimated Tier _____

Restricted ❑ No ❑ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistent _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

X Attach product label and MSDS to this form.

Describe the pest problem. The 2008 Tea Fire burned a 100-year-old olive orchard in Parma Park. Prior to the fire, the mature trees had a continuous canopy that shaded the understory and helped exclude other vegetation from the orchard, including native vegetation. The fire burned the olive trees, including the canopy, and native shrubs have established between and are encroaching upon olive trees. This is impacting the health and vigor of the olive orchard, which is a cultural resource within the park. Figure 2 includes photographs that illustrate: 1) the continuous canopy of the 100-year-old orchard; and 2) the post Tea Fire condition that includes an open canopy, small recovering olive trees and competing shrubs. Native shrubs to be removed included toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), *Ceanothus* sp. and lemonade berry (*Rhus integrifolia*). These chaparral shrubs have established and are growing rapidly as they have adaptations to fire including the ability to resprout from lignotubers after aboveground portions have burnt and postfire seed germination. Some plants store photosynthate reserves in extensive roots that are metabolized post-fire and provide a competitive edge over other species. The shrubs are competing with the olive trees throughout the orchard.

Describe the management goals and objectives for this site. To preserve and restore the existing 100-year-old olive orchard planted by the Parma family over one hundred years ago. The orchard burned in the 2008 Tea Fire and restoration of the olive trees is performed through management of olive stump sprouts, selecting new leaders and training leaders to tree form. Maintenance of the grove is performed to remove competing vegetation. Maintenance includes the manual removal of exotic annual weeds and grasses, and the manual removal of olive tree root runners and sprouts between established orchard trees. Competing brush and native shrubs will also be eradicated and is the subject of this IPM Committee request.

What is the damage threshold for this pest at this site? Elimination of competing native and non-native species will be completed, otherwise they will continue to invade and degrade the 100-year-old established olive orchard. Olive trees in the orchard are given priority over other species, due to the historic nature.

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site. Staff and contractors regularly observe the olive orchard and take note of plant, animal and insect species that may affect the grove. Craig Makela, Santa Barbara Olive Company, consulted with the City regarding the restoration of the grove and provided training to staff and grant personnel working at Parma Park in 2009, post Tea

Fire. Staff, contractors and a grant crew eradicated exotic species in the orchard and performed restoration pruning on the olive trees. Maintenance and/or restoration have been performed in the orchard on an annual basis since the 2008 fire. All work has been by manual means and included the use of chain saws, as needed. Some native vegetation has been removed but, in the past few years since the Tea Fire, native shrubs have grown rapidly, especially around the edges of the orchard.

Describe how the product would be applied including frequency, concentration, and method of application. Native shrubs (woody brush) would be cut close to the ground and the product (AquaMaster) would be applied to freshly cut stumps per label instructions. Frequency would depend on the effectiveness in control. Repeat application would be performed on new cuts, as needed.

What non-target impacts are anticipated? No target impacts are anticipated.

How does the use of this product help achieve the site management goals? Note if this is curative or preventative. Curative: Competing shrubs will be removed from the orchard to help restore and preserve this cultural resource. Preventative: Potential seed and runner sources that compete with orchard trees will be removed.

How will the effectiveness of this product be monitored? Include expected results and indicators of success. Staff and contractor will review treated stumps and the surrounding locations after application to look for resprouts or runners. If few to none are observed within a year or two, success will be presumed.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc. The trail entrance to the olive orchard can be accessed via a dirt road in the park. Access within the olive orchard is restricted due to the slope of the hill where trees are planted. The slope is enough to limit access with equipment, such as a stump grinder. Therefore, a stump grinder could not be used to remove shrub stumps. Maintenance is performed by hand in the orchard. All pruned or weeded material is dragged down the hill to the road since there is no truck access in the orchard. Parma Park is a pesticide-free zone.

List alternatives considered, alternatives implemented and why they were eliminated. Staff considered using a stump grinder, but truck access is not feasible due to the slope of the orchard. Goats were considered for browsing/removal of understory in the grove. Goats prefer olive vegetation and bark over other vegetation. Therefore, goats would impact the olives we are trying to protect and encourage. Some shrubs have been cut down in the past but they continue to resprout. The use of a flail mower was considered to cut young brush but, once again, the orchard is too steep to use this type of mechanical equipment. Also, leaving the live stumps perpetuates the situation: competition for water, nutrients and light in the orchard.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible. It is assumed that cutting down and stump grinding shrubs, as was done with the Eucalyptus grove post-fire, is the best method for shrub/tree eradication. As previously stated, a stump grinder cannot access this steep location. The cost to cut and re-cut down the same shrubs on an annual basis is cost prohibitive. There are limited funds and the money could alternately be spent on other invasive species management in Parma Park, such as the removal of onion weed, exotic pepper trees and other invasive species in the park. If the no action alternative was taken the native shrubs would take over the orchard and the 100-year-old cultural resource would be lost. Herbicides appear to be the best solution.

Was outside expertise utilized? ☐ No X Yes / Describe: Staff consulted with Makela, SB Olive Company. He suggested removal of competing species to help olives gain the advantage. Staff from City Forestry suggested herbicides due to the cost of continually cutting down shrub resprouts. The City Arborist suggests Glyphosate.

Describe future plans to prevent using the chemical again. The current situation was caused by the Tea Fire. Prior to the fire, herbicides were not used in the orchard as the orchard canopy shaded out other species and gave olive trees the competitive edge. As the olive trees grow and shade the ground they will again gain this competitive edge again, shading out native shrubs. In the mean time, when new saplings or small shrubs are observed, they will be manually removed before they grow into large shrubs/trees.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Signatures _____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

City of Santa Barbara - PARMA PARK

Legend

- City Limits
- Parks
- Assessor's Parcels - City
- Pacific Ocean
- Street Centerlines
- 2012 Aerial Imagery
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3

1: 9,051

0.3 0 0.14 0.3 Miles

NAD_1983_StatePlane_California_V_FIPS_0405_Feet

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Reported on 09/04/2013 06:46 PM

MAP DISCLAIMER

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Notes

FIGURE 1. LOCATION OF 100-YR-OLD OLIVE ORCHARD

PARMA PARK OLIVE ORCHARD

Figure 2. The photograph on left illustrates the continuous canopy of the 100-year-old olive orchard along the Creek Trail (photo credit Ray Ford 2003). The photograph on the right is the olive orchard in the process of restoration after the 2008 Tea Fire, from a similar vantage point along the Creek Trail (September 3, 2013).

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Dept: Parks & Recreation IPM Coordinator: Santos Escobar Phone: 564-5464

Pesticide Applicator (employee or company) Name: Parks Division Phone: 564-5433

Application Site: Shoreline, Leadbetter, Chase Palm Park, MacKenzie Specific Location:

Date(s): Product Name: Wilco Ground Squirrel Bait Active Ingredient: Diphacinone %: .005

Number of Applications: ❑ One-time ☐ Other -

Type: ❑ Emergency ❑ Trial xProgrammatic Other _____

Product type: ❑ Herbicide ❑ Insecticide ❑ Fungicide ❑ xOther Rodenticide_____

Application: ❑Ornamental ❑ Turf ❑ Golf ❑ Vector Control ❑ Park Tree ❑ Street Tree

❑ Right of Way x Vertebrate pest ❑ Other _____

Is the pesticide on the *Tiered Materials List*? ❑ No ☒ Yes If yes, provide the Tier 2

If the pesticide is not on the *Tiered Materials List*, provide the following screening information. See the IPM Strategy and the *Tiered Materials List* for instructions on screening the pesticide.

EPA Reg # 360929-17 Signal _Caution_____Estimated Tier _2_____

Restricted X No ❑ Yes/Describe _____

P Waste _____ PBT _____ WA PBT _____ Persistant _____ Mobil _____

Cancer _____ Repro _____ Neuro _____ Endocrine _____

Bird _____ Fish _____ Bees _____ Wildlife _____

☒ Attach product label and MSDS to this form.

Describe the pest problem.

At Shoreline, Leadbetter,Chase Palm and MacKenzie Park there has been a California ground squirrel, Spermophilus beecheyi pest problem for the past eleven years. The squirrels have burrowed and are creating safety infrastructure issues to ball fields, open turf areas, planter beds, picnic sites, sidewalks, asphalt parking lots and playgrounds. The IPM advisory committee has reviewed these sites in the past. Also the advisory committee has helped count how many squirrels were at Shoreline and Leadbetter Park when the squirrel infestation was out of control in 2006-2008. Parks will continue to trap squirrels. However, there needs to be another tool in the tool bag since Rodetrol squirrel bait is no longer being manufactured.

Describe the management goals and objectives for this site.

The management goal is to as thoroughly as possible eliminate the California ground squirrel.

What is the damage threshold for this pest at this site?

The goal is complete elimination of the California ground squirrel.

Describe the monitoring of the pest and potential predators that was conducted and the control methods previously used at the site.

Extensive trapping and Rodetrol baiting has been done at these site. The Parks Division has also monitored these sites.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Describe how the product would be applied including frequency, concentration, and method of application.

The product will be applied according to label instructions in bait stations and they will be secured. Also, bait stations will be placed where people should not enter or in fenced areas.

What non-target impacts are anticipated?

No non-target impacts are anticipated.

How does the use of this product help achieve the site management goals? Note if this is curative or preventative.

This is a preventative effort. Even though total eradication is desired this is highly unlikely.

How will the effectiveness of this product be monitored? Include expected results and indicators of success.

Parks staff will be monitoring squirrel counts and hopefully IPM advisory committee member can help as well.

Describe site conditions, for example consider the following: restricted access, distance from a creek or body of water, degree of runoff, site is a pesticide-free zone, etc.

These sites will be secured and monitored. The site is level and there will be no runoff. These park sites are in a green zone.

List alternatives considered, alternatives implemented and why they were eliminated.

As previously described, the use of traps and Rodetrol baiting have been implemented in the past. Traps will continue to be used. Rodetrol is no longer on the market.

Justification: describe why is applying this pesticide is the best solution and why a less-hazardous chemical, non-chemical option or taking no action is not feasible.

Wilco squirrel bait is the least toxic bait. 100% trapping is not feasible and as stated before Rodetrol bait is no longer available.

Was outside expertise utilized? ☐ No XYes / Describe

Phil Boise has been consulting the City of Santa Barbara. Also, **TERRELL P. SALMON, Ph.D.** is a Wildlife Specialist with the Department of Wildlife, Fish and Conservation Biology at Davis as well as County Director for the San Diego County University of California Cooperative Extension. Dr. Salmon is responsible for applied research and education on wildlife/human conflicts with emphasis on rodents and birds that cause problems in agricultural and urban settings. He has conducted an Extension and applied research program in the area of wildlife/human conflict.

Describe future plans to prevent using the chemical again.

Continue use of trapping method.

City of Santa Barbara
MATERIAL EXEMPTION REQUEST FOR PESTICIDE APPLICATION

Signatures_____ _____
Department IPM Coordinator City IPM Coordinator

Completed by the City of Santa Barbara Staff IPM Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments:

Completed by the IPM Advisory Committee

Vote Tally ____ Disposition: ❑ Approved ❑ Denied/Reason _____

If approved, follow the attached best management practices.

Comments: